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THE MAGAZINE FOR SAFER LIVING

JANUARY, 1989 VOLUME 11 NO. 1
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AMERICAN SURVIVAL

JANUARY 1989 VOLUME 11 NUMBER 1

THE MAGAZINE FOR SAFER LIVING GUIDE

COVER:
The American-made Striker semiautomatic 12-shot 12 gauge shotgun is an improved, magnum-firing version of the original South African shotgun. See page 36. Inset: Win this SOG Specialties Tigershark bowie, other great prizes. See pages 52-53 (Photos by Scott Stoddard).

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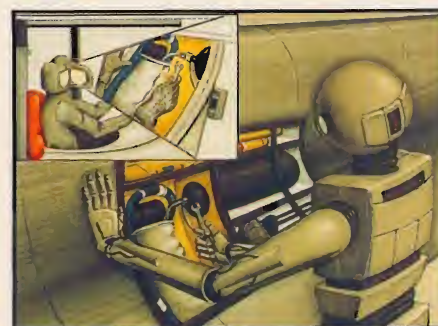
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KICKASS! More Mayhem From the Master of Malice

by George Hayduke

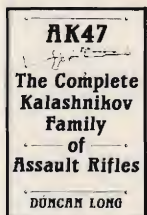
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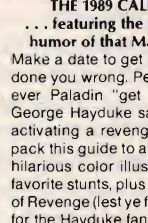
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TO THE POINT

No apologies for being a survivalist...

YEARS ago when I started working on this magazine, and for some time thereafter, I was self-conscious about admitting what my job was to people I met. I'd always try to explain my work in an apologetic way, hoping to win over the disapproving types.

The words "survivalism" and "survivalist" are dirty words to some people. They equate these terms with "extremist," "criminal," "crazy." But these people are misguided, prejudiced or ignorant. They don't know what survivalism really is.

Attempts by some in the media to portray all survivalists in a negative light angers me, although I realize there exist individuals and groups in society whom most of us would regard as extremist that call themselves survivalists. Unfortunately, these are the "survivalists" who get all the publicity.

When I took the job some years ago as associate editor of *ASG* I came from a background of newspaper reporting. I was not familiar with survivalism but I had been around guns much of my life. As a boy I had often gone shooting with my brothers and father and I possessed various small caliber guns. All my life my father has kept a revolver in his night stand for protection. My father is a survivalist, though he wouldn't say he is.

Working for *ASG*, I would occasionally be treated rudely or ignored by people on the telephone when I made calls to gather information for articles I was writing and so forth. I was struck by the hostile attitude of some people when I identified myself and the magazine. Fortunately, this type of reaction was rare, but it happened enough for me to realize that there are people out there who are narrow minded and prejudiced about survivalists.

Of course we on *ASG* use the term "survivalist" simply as a convenient way of categorizing the interests of our readers and people in general who study survival subjects and engage in survival-related activities. "Survivalist" is just a term to describe a way of

thinking, a mind-set that is oriented toward the fundamental human instinct for survival. This term covers a broad spectrum of people who share an interest in self sufficiency and self preservation.

Who are these people? Who are the readers of *ASG*?

Well, let's take as an example, the results of a computer analysis we did of approximately 1,000 readers who entered our 1988 Giveaway No. 2 contest. These were people who listed their occupations on their entry coupons. We use the information provided on the coupons to look at the background of readers. Here's what we found:

Represented were readers from every state in the nation, the District of Columbia and Puerto Rico. Average age was 36.27 years old. The occupational groups listed included carpenters, chemists, construction workers, clerks, computers operators/programmers, cooks, corrections officers, disabled veterans, emergency medical technicians, electricians, engineers, factory workers, farmers, fire fighters, investigators, laborers, machinists, maintenance workers, managers, mechanics, active duty military personnel, ministers, nuclear plant workers, painters, paramedics, physicians, police officers and police detectives, postal workers, retired people and especially retired military personnel, nurses, salesmen, security guards, self employed, students, teachers, technicians, welders, writers.

It's obvious that our readers come from a cross section of American society and represent the mainstream of society. Recognizing this, I have long since stopped apologizing for what I do when I meet people, they inquire about my work and, sometimes, I detect disapproval.

I'm not concerned any more about what narrow-minded, ignorant or just plain stupid individuals think of me or the magazine. I like what I do and I'm proud to be a survivalist. There'll be no more apologizing to anyone — *Jim Benson.*

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SURVIVAL LINE

**Air Force GWEN system completion approved,
university presidents call for common
curriculum on disarmament studies, world
famine feared if drought continues,
AIDS among top killer diseases...**

AFTER a two year delay caused by environmental impact studies and lawsuits brought by anti-nuclear activists, the U.S. Air Force has approved the completion of a vital emergency communications network.

The network, known as the Ground Wave Emergency Network, GWEN, is a nationwide system of low power radio antennas and transmitters intended to insure that the National Command Authorities, NCA, will still be able to launch a retaliatory nuclear strike, even after a first strike on the U.S.

The GWEN system has been assailed by anti-nuclear groups who say that any preparations to "fight" a nuclear war makes one more likely to happen. During the presidential campaign Jimmy Carter's former defense secretary, James Schlesenger, sharply criticized Gov. Michael Dukakis' opposition to the system.

According to the Air Force the system should be completed by 1992 at a cost of about \$600 million.

Peace In Our Time — At a recent meeting in France the presidents of 45 universities from around the world adopted a resolution which called for the development of a common curriculum on disarmament studies.

The university presidents included representatives from universities in the U.S., Soviet Union, China, Japan, Europe, and the Middle East.

The resolution called for the creation of courses in conflict-resolution and disarmament studies, and their inclusion as required subject matter across a wide field of academic disciplines.

The group is scheduled to meet again in Tokyo next year to assess their progress.

The Next Drought — If 1989 sees a drought similar to the 1988 drought

the effects on worldwide grain production and inventories could be catastrophic, so says the president of the Worldwatch Institute, economist Lester R. Brown.

According to Mr. Brown, if the 1989 U.S. grain harvest "were to be severely reduced by drought, exports would slow to a trickle." This would in turn cause prices to soar to a point that the most needy countries might be unable to purchase enough grain to feed their populations.

Both Mr. Brown and the U.S. Department of Agriculture have calculated that by the time the 1989 harvests are ready for distribution the world supply of grain will be down to a 54- to 62-day supply. This compares to an 89-day reserve of grain at the beginning of the 1988 harvests. Mr. Brown calls these amounts "little more than pipeline supplies" and sees the prospect of widespread famine should 1989 be another drought year.

Disease Tolls — For the first time AIDS has made the list of the top 15 killer diseases in the U.S. The National Center for Health Statistics said that in 1987 (the last full year for which statistics are available) some 13,280 people died from AIDS in the U.S. This moved AIDS into the 15th spot on the killer disease list, replacing birth defects. Some government estimates put the total number of AIDS infected people in the U.S. at 1.5 million.

The top 10 killer diseases in the U.S. and their annual death tolls are as follows: Heart disease — 762,000; Cancer — 477,000; Stroke — 149,000; Accidents — 95,000; Chronic Lung Disease — 78,000; Pneumonia and Flu — 70,000; Diabetes — 38,000; Suicide — 31,000; Chronic Liver Diseases — 26,000; Heart Attacks — 23,000. All told, 2.12 million people died in the U.S., and 3.82 million were born (a record) in 1987. ●

THE DUTCHMAN

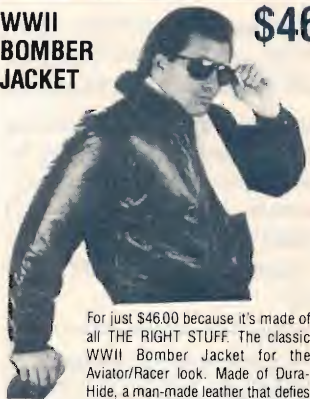
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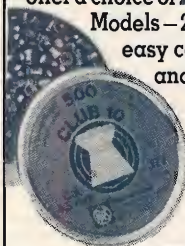


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BOOKS/VIDEOS

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Ragnar's Guide to Home and Recreational Use of High Explosives, by Ragnar Benson; Paladin Press, Dept. ASG, P.O. Box 1307, Boulder, CO 80306; (303) 443-7250; 112 pages, softcover; \$12 plus \$3 shipping.

This book is dedicated to those hardy souls who enjoy harkening back to a time when the use of explosives, and dynamite in particular, was a domestic necessity. With them, a single individual can dig a disposal pit or dry well in otherwise impenetrable ground, set posts, remove large boulders, redirect creeks, blow up bad guys, and perform a host of otherwise impossible chores of immense benefit to mankind. Recipes for improvised explosives include sugar chlorate powder, ammonium nitrate and R.D.X.



Personal Picks, a video featuring Eddie the Wire, author of *How to Make Your Own Professional Lock Tools*; CEP, Incorporated, Dept. ASG, P.O. Box

865-8LI, Boulder, CO 80306; (303) 443-2294; VHS or Beta; 120 minutes; \$49.95 plus \$3.50 postage and handling.

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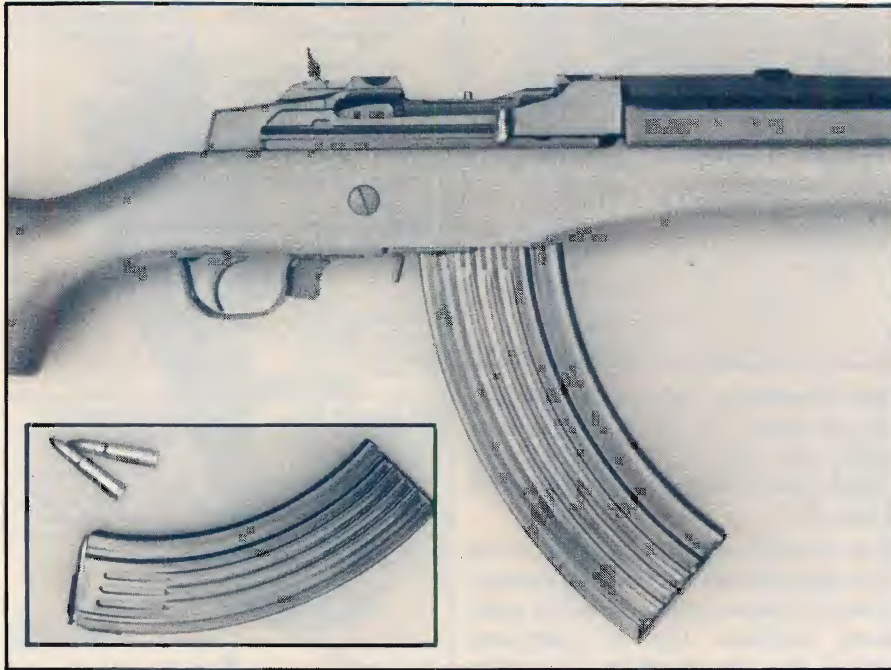
by
Mark W. Johnson



Crisis Communications, A Handbook for Emergency and Survival Radio Monitoring, by Mark W. Johnson; Tiare Publications, Dept. ASG, P.O. Box 493, Lake Geneva, Wisconsin 53147; (414) 248-4845; 84 pages, softcover; \$10.95 plus \$1.25 shipping and handling.

This book includes the frequency listings for a wide range of agencies and groups that may play an important role in emergency situations. The U.S. Army, National Guard, the Corps of Engineers, U.S. Air Force, SAC, TAC, Civil Air Patrol, U.S. Navy, Coast Guard, Federal Emergency Management Agency and numerous others. Learn how to choose the necessary radio equipment to tune in on these lifesaving frequencies and how to set up your listening post, install an antenna, and organize your monitoring.

NEW PRODUCTS



30-rd Mini Thirty Mags

If you own one of the new Ruger Mini Thirty rifles in 7.62 X 39 mm (Russian) caliber you've probably been waiting for someone to market magazines with a capacity greater than the standard 5-round magazine that comes with the rifle. The wait is over. Federal Ordnance of South El Monte, California, announces its new high capacity Mini Thirty magazine. Fed Ord was the first to produce a high capacity mag for the Ruger Mini-14 rifle and has sold more than one million of them to date. The new Mini Thirty 30-round mag is made by Fed Ord in the United States of 22 gauge steel. It is expected to be available Jan. 1, 1989. Suggested retail price was unavailable at this writing. Contact Federal Ordnance, Inc., Dept. ASG, 1443 Potrero Ave., South El Monte, CA 91733; (818) 350-4161.



U.S. Cavalry 1989 Catalog

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Camo Tape, Water Bladders

Sierra Supply has two new items for the outdoors/survival market: camouflage duct tape for disguising field gear and new 5-quart water bladders of plastic 6 mil mylar that fold flat for compact storage when not in use. The 2-inch wide, woodland camouflage pattern duct tape will stay on most metal or other surfaces and blends well in many outdoors settings. Price is \$7.95 per roll postpaid in the continental U.S. All other requests \$9.50 postpaid. Also

great for field expedient repairs on packs, web gear, etc. The water bladders fold out empty to 13 by 17 inches. When filled with water they can line a closet shelf or some other compact storage space. Finger tab dispenser is spill proof and leak proof. A great water storage bargain. Price for five 5-quart water bladders is \$12.50 postpaid. Contact Sierra Supply, Dept. ASG, P.O. Box 1390, Durango, CO 81302; (303) 259-1822.



Survivor's Choice Face Shield

The Survivor's Choice ballistic face shield, available for sale to law enforcement and government agencies only, is designed to stop a variety of projectiles up to and including .44 Magnum. Six inches high and weighing 1.5 pounds, the shield wraps around the face of the wearer and attaches to the sides of his helmet. Made in Europe and consisting of a laminated polycarbonate material with changed molecu-

lar structure, the shield is only 3/4-inch thick but has the same bullet-stopping capacity as Lexan that is 3 inches thick. The shield distributor, Patriot Distribution Company, also plans to offer a body shield of the same material which will be available to corporate security personnel as well as law enforcement. Contact Patriot Distribution Co., Dept. ASG, 2872 S. Wentworth, Milwaukee, WI 53207; (414) 769-0760.



Code Red 20-Year Batteries

A new type of battery with a guaranteed storage life of 20 years gives assurance that an absolutely fresh battery will always be available on demand whenever it is needed. Ideal for outdoors, marine and general use. Code Red features a unique "twist top" that activates the cell's energy producing chemicals when power is needed. Until energized, the cell remains at peak potency, ready to work and after activation, it produces more power over a longer period than even a newly manufactured heavy duty zinc carbon battery can. Code Red contains no toxic materials to pollute the environment, and Code Red is waterproof. Once activated they cannot be turned off and are not rechargeable but will retain their charge about the same length of time as regular batteries when not in use. Code Red batteries are available from NITRO-PAK Storage Foods & Emergency Supplies, Dept. ASG, 11018 E. Rosecrans Ave., Suite 300, Norwalk, CA 90650; (213) 929-4705. Available in D cell only. One twin pack is \$7.49 plus \$2.95 S&H, six twin packs are \$40 plus \$3.50 S&H, a case of 12 twin packs are \$75 plus \$4.75 S&H.



Parker Knife Set

Parker USA has assembled for the everyday worker and seasonal hunter a unique collection of cutlery accessories in one beautifully boxed gift set: Parker's A139-PG five inch folding hunter with black and wine Parker-

wood handles and U.S.A. 440 surgical steel blade, quality leather sheath, genuine Arkansas sharpening stone and all purpose honing oil. This new addition to Parker's U.S.A. made line contains everything knife enthusiasts

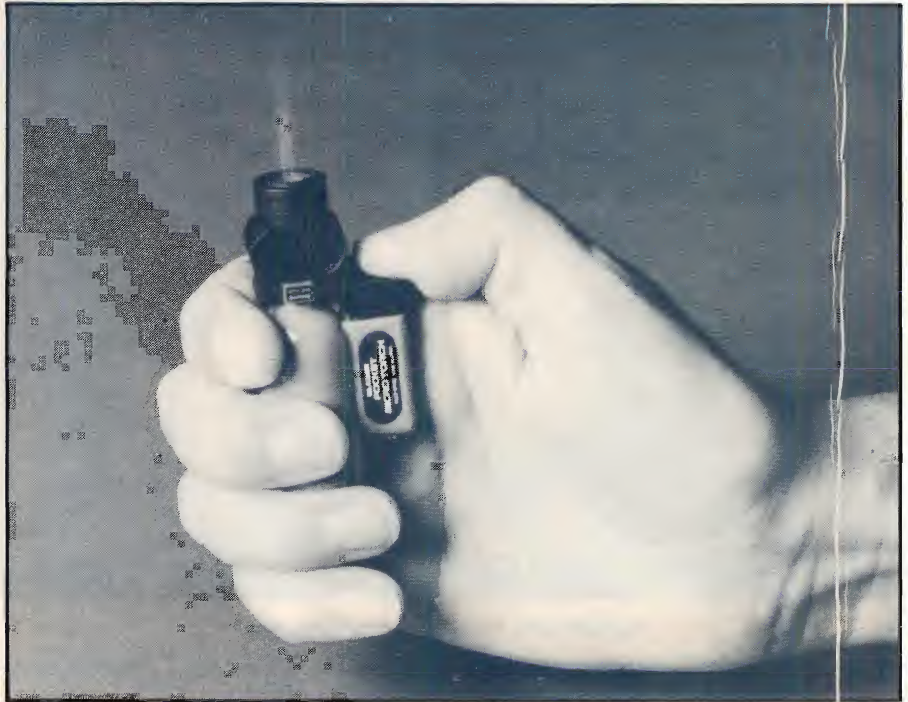
need to keep their knives in excellent working form, including instructions on proper blade sharpening. Contact Parker Cutlery Association, Dept. ASG, P.O. Box 22668, Chattanooga, TN 37422-2668; (615) 894-1782.

NEW PRODUCTS



Swagman Australian Short Coat

Aussie ranchers have relied for a century on genuine oilskin clothing for all-weather protection. Oilskin is actually 100 percent cotton fabric treated with a secret oil formulation making it waterproof, windproof and breathable. If you soil the coat, hang it up and hose it off. The packable Swagman is a superb choice for town, trail or casual wear. The coat is cleverly constructed to fold up into an internal pouch pocket with belt loops for carrying on your side. Classic features include roll-up drawstring hood which forms the collar, full snap down shoulder cape, two way zipper with snap storm flap, underarm vents, roomy flap pockets and lined hand warmer pockets, 100 percent cotton drill lined interior, waist drawstring and brass hardware. Your choice of black or brown. Sizes S,M,L, XL. Price is \$119.95 and includes Brigade's "110 percent mistakeproof moneyback guarantee" of satisfaction. Order from Brigade Quartermasters, Ltd., 1025 Cobb International Blvd., Dept. 93K, Kennesaw, GA 30144-4349; (404) 428-1248.



Pocket Micro Torch

A new, small but mighty pocket micro torch is perfect for those small jobs that a big can't handle. The Blazer Pocket Micro Torch has two flame levels, 800 degrees C. or 1,300 degrees C., and can be used to solder, harden metal, sterilize needles, as a portable torch for a dental technician, mechanics, etc., or it can even be used as an emergency light. It is easily replaceable with Blazer butane and has a protective safety cap plus even a detachable stand which allows for either one or two hand

use. One of the most important features it offers is a state-of-the-art Piezo electric ignition system which eliminates the need for matches and lighters making it completely self contained and truly portable. Retail price is \$39.95 postpaid from Blazer Products, Dept. ASG, 114 E. 32nd St., Suite 906, New York, NY 10016; (212) 532-1166. Ask about the Blazer Deluxe Survival Kit PB207 with torch and other survival gear, and the RF300 Butane Refill.



Ceramic Knife

Boker, of Solingen, West Germany, introduces a ceramic blade in its pocket knife collection. This brand new ceramic material, which remains sharp indefinitely, has a hardness second only to diamonds, is ultra light and extremely abrasion and corrosion resistant, is non-magnetic and electrically non-conductive, and is durable at high pressure and high temperatures. Boker presents this new blade in an ultralight pocket knife with a Space Age titanium handle with a suggested retail price of \$115. Boker Tree Brand knives are distributed in the U.S. by Boker USA, Inc., Dept. ASG, 14818 West 6th Ave., Suite 17A, Golden, CO 80401; (303) 279-5919.

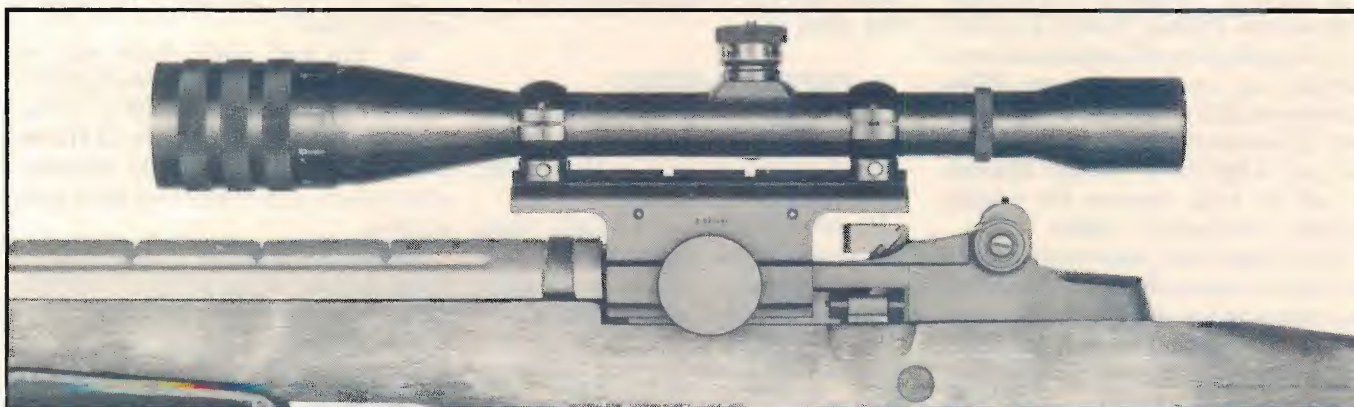
Miniature Handie Talkie

ACE Communications introduces a new miniature two way radio transceiver that offers 6 watts of power output on VHF High Band frequencies. Measuring 5 inches by 2¼ by 1⅞-inches and weighing only 19 ounces, the unit covers a frequency range of 150-174 MHz. Besides 6 watts, it offers .3uV Sinad Sensitivity and a 5 MHz, zero degradation frequency spread, plus -70 db Spurious, Intermodulation and Adjacent Channel rejection. The unit, the new model Triumph BC-105, can be carried in a pocket, with the standard belt clip, or in an optional ⅛-inch thick leather carry case. Suggested retail for the unit is \$279, which includes a 450 MAH rechargeable battery, AC charger/adapter, flexible rubber antenna, stainless steel belt clip, soft protective case and a fast/slow rate drop in charger that is capable of simultaneously charging the radio itself plus an extra battery. Contact ACE Communications, Monitor Division, Dept. ASG, 10707 E. 106th St., Indianapolis, IN 46256; (317) 842-7115.



M1A/M14 Scope Mount

B-SQUARE's new military mount for the M1A/M14 rifle is quick on and off with a single knob attachment and returns to zero. It has elevation adjustment to help align hi-power sniper scopes and is see-under so the gun's sights can be used with the mount installed. This new mount has a standard dovetail and is long enough for



mounting all Aimpoint and military devices. It has improved style lines and a matte finish to match the gun. Sug-

gested list is \$99.95 complete with 1-inch standard dovetail rings. Available at dealers everywhere, or contact

B-SQUARE Co., Dept. ASG, P.O. Box 11281, Ft. Worth, TX 76110-0281; (817) 923-0964. ●

Safety, Enjoyment:

Ten Rules for Surviving Abroad

Preparation and general knowledge...



Eating and drinking in many parts of the world may lead to sickness and even death.

By Charles W. Sasser

A few years ago I was “chicken bussing” in Mexico with my four-year-old son Joshua when a man and his wife spotted us in Tampico and came running up, so happy to see fellow Americans that they were wagging all over. It seemed they had misplaced their car and didn’t know enough Spanish to ask for help. Besides, the woman needed a restroom — badly.

Many Americans who travel abroad are babes in the outback when it comes to possessing the survival skills necessary to safely travel foreign lands. Touring other countries with different languages and customs is *not* like climbing into your Chevy and driving to Kansas or New Jersey. Having traveled around much of the world for

the past 25 years, since I was 18, I have developed from sometimes difficult experience 10 general rules to help Americans traveling abroad to survive and enjoy it.

1. PREPARE FIRST:

Advance preparations may mean the difference between withering away in some forgotten seaport or blossoming on a sun-strewn beach.

It can save you a lot of trouble when you arrive at your destination to have already planned a broad but flexible agenda of what to see and do, where to go, and where to stay. It is also important for your security and well being to have boned up on local customs, history, political climate, and the requirements necessary for entering and leaving the country you plan to visit, such

as passports and visa information. It will also be helpful to know the exchange rate of currency and to have a general idea of how much things and services cost.

All this and much more can be obtained from published travel guides. The best of these is *FODOR’S*, which is so detailed that Army Special Forces teams preparing for military missions often refer to it in conducting their area studies.

Also in preparing for your trip, don’t forget to take along personal identification and the names, addresses, and phone numbers of next of kin in case of some misfortune in-country. A letter of instruction, written in the language of the country in which you are traveling, detailing what you wish done in the event of an emergency may prevent

later confusion.

Always let someone at home know where you plan to be on which dates and when you expect to return home.

2. LEARN THE LANGUAGE:

Obviously, you cannot learn the language of every country you wish to visit. However, if the lady in Tampico had simply memorized the Spanish phrase for "I need to use the restroom," she could have saved herself unnecessary discomfort.

Other helpful key phrases that you should memorize include: "I am ill; Call the doctor;" "Call the police;" "I am lost;" "Where is the (bus, train, plane) station?;" "How much does this cost?;" "Where is the (hotel, restaurant, etc.)?;"

Take along an English-foreign language dictionary. If nothing else, you can always point to the word or phrase you wish to communicate.

3. TAKE CARE OF MONEY:

Although almost anyone in the world will accept a U.S. dollar, to use anything other than local currency in some countries is considered black marketing, a crime for which you can be arrested.

It is safer to change into local currency at banks or authorized offices of exchange at airports or customs stops. Private money changers at many points of entry, especially into Third World nations, may cheat you or even rob you. Even though the money changers are technically black marketing, argue with them and you could find yourself on the losing end of a police-mediated dispute. Americans throughout the world are considered rich; you're not likely to get much sympathy from the authorities.

To help me not only in the exchange of currency but also in computing prices, I always carry a little card on which I have compared dollars and local currency in denominations of up to one hundred dollars. That way I can refer to my card and see that an item priced at 60 *colones*, for example, is \$10.

Carry as little actual cash with you as possible — and don't flash it. Use credit cards like MasterCard and Visa, which are accepted worldwide. American Express or International Travelers Checks is the safest way to carry money and can be easily converted to cash.

I also separate what cash I do have on me, sometimes hiding a large bill in my sock or boot to use in an emergency. I have seen gangs of barracuda in Colon and other places that can slit a tourist's pocket with a razor, finger



Traveling abroad is not like climbing into your Chevy and driving to Toronto. Living conditions in parts of the world, and thus traveling itself, may be primitive.

out the wallet, and disappear before the victim has time to shout "Montezuma's Revenge!"

That is why men should carry their wallets in their front pockets and women should avoid large purses with straps. Coin purses and hand wallets are safer.

4. TRAVEL LIGHT:

I discovered this rule the hard way when I transferred from one Guatemalan bus to another, assuming my luggage would be transferred for me. It wasn't.

Traveling in the U.S. can spoil you for traveling in foreign lands where you may be responsible for seeing after your own baggage. There may even be times when you have to carry your own things from the bus station or airport to the hotel. Just once stranded somewhere with 17 pieces of luggage will teach you the practical necessity of traveling light.

I generally travel with a large day pack that I can carry on my back. If I have to walk, as is sometimes necessary, I have all my belongings with me. you can always buy native clothing to wear that is both attractive and surprisingly inexpensive.

There is one other important reason for traveling light. Most airlines place size and weight limitations on baggage. Traveling light going means that you

can return with more foreign purchases — gifts for everyone.

When it comes to baggage, there is one firm rule that should never be broken: Don't put money, checks, passports, jewelry, cameras, or anything else expensive or irreplaceable inside your luggage. Carry these items on your person. I use a leather photographer's bag and keep it with me at all times.

5. TAKE CERTAIN ESSENTIALS:

While traveling light, don't neglect to take along certain essentials that may be difficult to acquire at your destination. Such things as band-aids, sanitary napkins, mouthwash, and sometimes even toilet paper may not be readily available, according to where you are going. Personal toiletries and prescription medicines should always be taken. Don't forget to take along the prescriptions for any medications; you don't want to be accused of drug smuggling.

If in doubt about an item, and if it is an essential one and not too bulky, take it along. Make a list of all these essentials during your preparations stage and try to determine which of them can be purchased locally once you arrive.

6. USE LOCAL TRANSPORTATION:

You may have to keep personal tabs on your luggage and adjust to last-minute schedule changes, and you may have to eat tortillas or rice on the run, but if economy is a consideration and if you want to meet and get to know the real people of a country, then use transportation used by the common people. One of the most rewarding experiences I ever had traveling was taking the narrow-gauge railroad train across Panama from Colon to Panama City.

Busses remain the principle means of mass transportation in most countries in the world. They are cheap and fun to catch. You may have to share the journey with pigs or turkeys, but the ride is always alive and exciting with sound, color, and smells.

And it is a cheap way to go. In Mexico, for example, you can still travel from Tampico to Laredo, Texas, at a cost of about \$20. I once rode busses from San Salvador to the Rio Grande at a fraction of an airlines fee or what a similar bus trip across the U.S. would have cost.

Taxis can be a rip-off if you aren't careful. Not always government-regulated, they frequently charge whatever the

Ten Rules for Surviving Abroad

traffic will bear. I have seen taxi fares double the instant a well-dressed tourist hove into sight. Always establish the fee before you get into the taxi; otherwise, the short trip from airport to hotel may end up costing you a day's pay — and there is nothing you can do about it.

I make a habit of walking three or four blocks away from an airport or bus station before I hail a cab. That way, you're usually assured of being charged local going rates.

Better yet, I take the local busses with their psychedelic paint jobs and plastic Jesuses on the dashboards. You can travel all over most cities in the world on nothing more than pocket change. You also aren't ripped-off by cabbies wanting to take you to "special" hotels, nightclubs, or restaurants where the accommodations are cheap and the prices high and the cabbie gets a cut of the action.

No matter how you travel, however, whether it's by train in Korea or Europe, TACA airlines in Latin America where Catholics genuflect before taking off, or by local bus, break down the trip into legs with pauses in between for rest and sightseeing. There is nothing more tiring or uninspiring than a single long trip. Half the fun of going is getting there — especially if you use local transportation and travel with the people.

7. UNDERSTAND LOCAL CUSTOMS:

Each society has its own code of what is and what is not acceptable behavior. A little advance review of local customs may save you later embarrassment, or even worse. You should at least know enough to prevent patently offensive behavior. Bikinis, for example, or even less, may be perfectly acceptable on the Riviera but taboo in Jakarta. In Inchon, Korea, I was using a public restroom when a woman walked in and availed herself as my neighbor. That is common in most of the Orient.

Most libraries and book stores stock books on foreign lands and their people. Again, *FODOR's* is an excellent reference.

8. TAKE CARE IN DRINKING AND EATING:

People in many parts of Asia live with parasites that would destroy an American. Some water drunk by locals may actually kill a foreigner unaccustomed to it.



Learning about the land you plan to visit (Prepare First, Rule No. 1) will assist you in understanding the nation and aid in your safety by helping you decide where and where not to go.

The best rule for eating and drinking in foreign lands, especially in underdeveloped nations, is to drink bottled water or liquids such as Coke. Boil your water otherwise, or drink that from the larger cities. Never drink water from wells or from small local systems. In eating, avoid ham and spicy meats, wash fresh vegetables carefully in good water, use canned goods that are at least a nationally recognized brand, and dine out at only the better restaurants.

As an added precaution, I keep my international vaccinations current, take along prescription tetracycline to combat dysentery, although I've never had it, and check with my doctor when I return if I notice any unusual physical signs or symptoms.

Otherwise, when it comes to drink and diet abroad, you simply have to take your chances.

9. DRESS NATIVE:

The best way I have found of countering the tendency to raise prices for the "rich American" is to either dress like the ordinary locals or to don whatever foreigners who live in the

locale are wearing. This helps you in traveling light as well as in convincing merchants and others that you deserve treatment as a local instead of a tourist.

10. BE FRIENDLY:

Because of international terrorism, many Americans are either postponing traveling to foreign lands or are suspicious of the locals whenever they do travel. Terrorism is not a reason to stay home. Your chances of being hijacked or kidnapped are about the same as stepping outside your door and being struck by lightning or bitten by a rattlesnake. You should be more concerned with common thieves and dysentery than with terrorism.

With some preparation and a general knowledge of these 10 rules for surviving abroad, you can travel safely and happily almost anywhere in the world. People, I have found, are simply people wherever you find them. Greet them with a smile and a return smile is almost always your reward.

A smile, I have also found, can get you a lot farther than even a dollar bill. ●

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Tension Breaks: Stress

Exercise and preventive techniques can cut the cycle of tension...

By Douglas Stephens

DO you feel irritable, burned out in your present job? Do you often come home from work more tired than you should? Do you find yourself biting everybody's head off both at work and at home without any real reason? Do you sometimes wonder if you will ever reach your real potential?

If your answer is, "Yes" to any of these questions, you are probably suffering from excessive stress.

As a baby in the crib we all begin to suffer some sort of stress and it stays with us all our lives. It is a stimulus in our environment felt by everyone. Some people can experience a great amount and respond in a normal way. Most of us can't cope all the time and suffer physical and emotional changes. Some stress is good. It helps us deal with everyday life and sudden emergencies. Most people could not get out of bed and go to work without it. Excessive stress produces distress and strain, disrupting our lives. The cause may be biochemical, physical or emotional. When we learn to handle stress, make it work for and not against us, it can be beneficial. Maybe you should change jobs, but if the pay is satisfactory and all other things good, perhaps the next position would prove more stressful than the present one.

Why not conquer your stress instead? Understand it, then fight it. Learn how to cope with it effectively. By doing so your job, which you hadn't thought you liked, will not only become less stressful but you will find yourself happier, more productive and surely more healthy.

If your work involves dealing with the public, you will have to live with their idiosyncrasies and frustrations at the same time being pleasant and congenial to them yourself.

Exercise and preventive techniques can cut the cycle of tension. By using the following seven "Tension Breaks"

THE STRESS OF ADJUSTING TO CHANGE

EVENTS

SCALE OF IMPACT

Death of spouse	100
Divorce	73
Marital separation	65
Jail term	63
Death of close family member	63
Personal injury or illness	53
Marriage	50
Fired at work	47
Marital reconciliation	45
Retirement	45
Change in health of family member	44
Pregnancy	40
Sex difficulties	39
Gain of new family member	39
Business readjustment	39
Change in financial state	38
Death of close friend	37
Change to different line of work	36
Change in number of arguments with spouse	35
Mortgage over \$10,000	31
Foreclosure of mortgage or loan	30
Change in responsibilities at work	29
Son or daughter leaving home	29
Trouble with in-laws	29
Outstanding personal achievement	28
Wife begins or stops work	26
Begin or end of school	26
Change of living conditions	25
Revision of personal habits	24
Trouble with boss	20
Change in work hours or conditions	20
Change in residence	20
Change in schools	20
Change in recreation	19
Change in church activities	19
Change in social activities	18
Mortgage or loan less than \$10,000	17
Change in sleeping habits	16
Change in number of family get-togethers	15
Change in eating habits	15
Vacation	13
Christmas	12
Minor violations of the law	11

or "TBs" you will find they lighten your work tensions and bring about a state of relaxation and well being.

A checker at the grocery store, a clerk in a retail store, a typist or a computer operator, or possibly any person in an office or business can find some quiet corner to practice these TBs. If they are used daily, in a few months they will become a habit. They need not take long, only six seconds to no longer than five minutes.

NUMBER ONE: Time 6 seconds.

This can be done 50 or 60 times a day or whenever you feel tense or irritated. Start by smiling inwardly with your mouth and eyes, then say to yourself several times, "Alert mind — calm body." Then take a deep breath all the way down to your abdomen. As you exhale, let your jaw, tongue and shoulders go limp while you feel a wave of warmth and heaviness sweep down to your toes. Now resume normal activity.

NUMBER TWO: Time 2 to 3 minutes.

Find a spot where you can be alone. Sit down, if possible. Close your eyes, breath deeply, relaxing every part of your body. Imagine you are walking by a beautiful mountain lake or by a quiet running stream. Make yourself really believe you are there. Hear the rustle of leaves, the birds singing, the sound of water lapping the shore or the running of the stream. Perhaps you are floating in a boat on the smooth, blue water of the lake. Smell the flowers and the pine trees. Feel the sun and breeze on your body. Allow yourself to let go completely.

NUMBER THREE: Time 2 to 4 minutes.

In a quiet location, sit down and relax your shoulders. Place your hands comfortably in your lap, close your eyes. Listen to the sound of your breathing. Feel your breath at the tip of your nostrils as you inhale and going out at the tip of your nostrils as you exhale. Take a few deep breaths until you feel yourself relaxing.

Keep your eyes closed, turn your head to the right very slowly as far as it is comfortable. Turn your head to the left the same way. Bend your head forward and slowly toward your chest. Turn your head and shoulders from the waist to the right then the left. Raise both shoulders and rotate them backward three times. Do the same rotating forward three times.

Raise both shoulders while you bend your head backward. Take a deep breath. Wiggle your fingers and toes. Gently open your eyes. Go back to work more relaxed.

NUMBER FOUR: Time 3 to 4 minutes.

For this one take off your shoes. If you have a carpet, work your toes, bottoms and sides through the carpet. Pick up and indulge one foot at a time. Warm it between your hands. Massage between each toe using gentle finger pressure on each joint. Using the thumbs apply pressure to the bottom of your foot. If you find tender spots, continue to work into and around that area. Massage around the heel and on top of the foot. Vary the strokes and pressure to prevent hands and fingers from tiring. Finish by lifting one leg with both hands from under the thigh and shaking the lower leg. Allow ankle to be loose. Straighten leg from knee and lower it slowly. Repeat with other leg.

NUMBER FIVE: Time 3 to 5 minutes.

Think of yourself as a rag doll. Shake your right hand then your left. Let your mouth and head be slack then shake your head like a doll. Shake out your left leg then your right. Hop on your right foot — shake your left. Repeat standing on your left foot. Jump and wiggle your body, moving your arms all around. If you are alone in a sound proof room you can sing, laugh, shout, make noises and let go. Otherwise try doing this silently.

NUMBER SIX: Time 3 minutes.

Try laughing to restore your good

humor. Repeat, "Ha, ha, ha" until you are genuinely laughing out loud if possible. Laughter relaxes a lot of involuntary muscles while increasing the oxygen consumption and circulation.

NUMBER SEVEN: Time 2 to 3 minutes.

Reduce eye strain. People who spend long periods intensely concentrating on a small object like a computer screen or closely written words on paper can suffer from eye strain. Direct lighting of varying power (fluorescent or incandescent) can be irritating to the eyes and lead to pain and tension. Try to shield the eyes from glaring light. Even with the best light the eyes still can get tired after some time. To relax the eyes look away into the distance, changing focus every so often. Consciously blink and take deep breaths.

Allow a feeling of relaxation to begin with the top of your head and feel it spread through the muscles of your scalp and forehead. Let yourself actually feel the muscles on the forehead relaxing. Allow your cheek, face and jaw muscles to let go. Breathe normally, count 12 breaths, not letting any other thoughts distract you. When you are ready to go back to work, take a deep breath and open your eyes.

Take tension out of your driving. City freeway and other heavy traffic to and from work or in job related driving can build up tension. Before you leave your home or the office parking lot take a moment to relax. Try relaxing your shoulders as in exercise NUMBER THREE (2 to 4 minutes). You will make up this time by being a more relaxed driver. According to research by Baylor University and the University of Michigan, a tense driver is

Would you like to know more about stress?

These organizations publish books and pamphlets on coping with stress.

American Heart Association
7320 Greenville Avenue
Dallas, Texas 75231

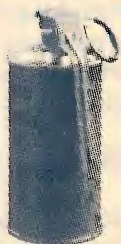
Family Service America
11700 West Lake Park Drive
Milwaukee, Wisconsin 53224

Krames Communications
312 90th Street
Daly City, California 94015-1898

Public Affairs Pamphlets
381 Park Avenue South
New York, New York 10016

National Institute of Mental Health
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Stress

second only in vulnerability to accidents to a drunk driver.

Adjust your demands, decreasing the force. We either are race horses or turtles. Some people thrive on an energetic lifestyle and produce best under pressure which does not bother them. They have developed an adaptability to pressure and know how to decrease their resistance to it thus reducing stress. Delays to them can be more frustrating and stressful.

Others are the turtles. They function best at a slower pace. If you push them, put them under pressure, they develop stress, become irritated, agitated. Determine your type and adjust your life style to it.

Learn to ask yourself this question, "Does this have to be done now?" Spend your energy on those things that have to be done at this time. All of us have only so much energy. When it is used up, it takes time to replenish. Try to delegate many minor jobs to someone else. Keep your energy for the important things that only you can do.

Flexibility or resiliency is important if you wish to reduce the damage stress does to your body. Flexibility is synonymous with mental health. This allows you to use stress to help, rather than hurt. Move with conditions, don't fight them. Flow with the force, don't try to buck against them.

Don't try to be a perfectionist. This is the Achilles' heel of many people. No one can be perfect, we can only strive for perfection. If we do not reach it, don't let it floor you. Accept the fact that perfection is something we can try for but not always attain.

You have heard many people say, "Why does this happen to me?" Remember what happens to you is not as important as what you do about what happens to you. Everyone has things happen to them. Tell yourself you have not been singled out for all the bad things that happen to you. Take the failures with the successes. They usually balance out. We can learn from both.

Stress is something everyone has. By facing it, not running away, learning to cope by using tension breaks, you can help face the everyday stresses of this modern world. ●



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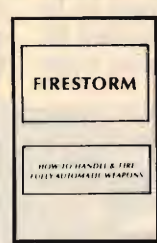
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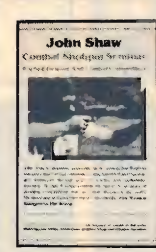
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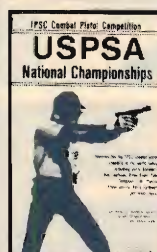


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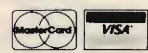
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Mitchell Arms:

7.62 NATO AK-47 Rifle

By Jim Benson

WHEN we first reported that Mitchell Arms would be importing Yugoslav AK-47s in 7.62 x 51 mm (NATO) caliber in the July 1986 issue of *ASG* we were eager to test one.

They are finally being sold here in the U.S. and demand appears to be brisk. Available on the U.S. market for only about the past six months, these

new 7.62 NATO (.308 Win.) AKs are of the same high quality that sets Yugoslav AKs apart from other Kalashnikov rifles.

The fixed stock AK-47 Model M77B1 from Mitchell is, except for semiautomatic type of fire, full military quality or better and exhibit those special features offered only on the Yugoslav AKs,

including full teak wood fore end, butt stock and pistol grip, extra thick walled stamped steel receiver and rubber butt plate and flip-up tritium night sights besides the standard iron sights. Additionally, all these rifles come with a scope mount rail permanently affixed to the left side of the receiver. This is

(Continued on page 69)



Louis Mitchell fires the M77B1 with Yugoslav 4 power scope and with a Leupold 3 x 9 Compact scope at targets 150 yards away. The targets show the results.



Louis Mitchell of Mitchell Arms fires the AK-47 .308 NATO rifle with Yugoslav 4 power adjustable scope made for it.



Shooters found the recoil from the gas-operated .308 AK quite manageable.

Greenhouse Effect Vs. Ice Age:

Climate Change





1, 2 & 3. Changing weather patterns could bring more droughts with devastating effects such as these drought-damaged soybean and corn crops (U.S.D.A. Photos by Fred S. Witte, Gordon Baer and June Davidek).

4. Some scientists believe that rather than the earth warming from the greenhouse effect, there is more evidence to indicate the approach of a new ice age with much colder weather (Rusty Gillette).

5 & 6. The frequency of severe weather disturbances such as floods, droughts and hurricanes is believed to increase during periods of climate change. These photos show effects of Hurricane Frederick (1979) and Hurricane Camille (1969) on the U.S. Gulf Coast (N.O.A.A.).

6

5



Are we in for a major global warming trend, or heading into another ice age that could last 90,000 years? . . .

By Becky Gillette

CLIMATE CHANGE. It could be Mother Nature's ultimate revenge. An inevitable doomsday caused by mankind's shortsighted tampering with the delicate — and still little understood — mechanisms that keep the earth's climate within the narrow range of extremes that will support life.

Weather extremes of all sorts — from droughts to floods, heat waves to record cold spells and severe storms to the retreat of monsoons in areas which can ill afford the loss of rain — have been blamed on climate change. And, if you believe the majority of predictions, what we've experienced so far, including the famines in Africa and billion-dollar agricultural losses from recent U.S. droughts, may just be minor troubles compared to what's ahead.

Consider the following comments: "Even for the most highly industrialized countries a significant change in climate could strain all available resources, possibly leading to wars of conquest on the one hand, or extremely expensive adaptation, such as climate domes, on the other." John H. Douglas, *Science News*, March 1, 1975.

"Scientists . . . have long known that human activities, particularly the

burning of fossil fuels, are artificially increasing the volume of greenhouse gases in the earth's atmosphere and that this increase eventually will make the planet the hottest it has been in human history.

" . . . These changes will dramatically affect both human and natural systems, threatening such crucial activities as agriculture, forestry, fisheries, pollution control and the protection of parks and preserves." Laura Tangle, *BioScience*, January 1988.

" 'Greenhouse effect' a threat to earth life," headline, Gannett News Service article, Nov. 11, 1987.

"If the recent run of droughts in Africa and the eastern U.S. is typical of what we're going to see with carbon dioxide-driven warming, then there's going to be unprecedented pressure on the globe. Then we're looking at death on an enormous scale." Climatologist Mick Kelly, *Discover*, January 1986.

"The dismal result of efforts to achieve truly interdisciplinary research in science and the dismal performance of some official agencies may foretell a dismal end for most of the world's population in the next 15 years," consulting

(Continued on page 64)

Nuclear Protection:



Workmen prepare the hole before placement of the module. Note the bed of gravel for drainage.



Workers assist a backhoe operator to properly position the shelter module on the Jackson property.

Low-Cost Underground Shelter

A small investment for a potentially large return . . .

By Bill Volkart



The shelter with its waterproof asphalt coating in position before being covered with earth.

DESPITE the recent thawing of hostilities between the two superpowers and the apparent decay of the Chinese communist state, we still live in a world where nuclear war is a distinct possibility.

And while many people would like to think that the danger is past, there are those individuals who have studied their history books and are quite aware of just how many times the world has been declared at peace in the past only to subsequently descend into war. And don't forget the fact that the world's nuclear club of nations is growing, bringing less-than-stable rulers the power to terrorize their perceived enemies.

Clearly, the U.S. is not out of the frying pan yet and a number of Americans continue to remain prepared to survive in the event things don't work out the way we'd like.

One such person residing in the heavily industrialized area of southwestern Ohio, a primary target for

Soviet missiles, has designed and built an inexpensive and surprisingly efficient subterranean shelter to protect his family. Better than the cost factor, this shelter can be constructed on a driveway and placed into position by one man operating a backhoe, both good points in a nation that may find itself suddenly short of qualified engineers during wartime.

Newton Jackson (a pseudonym) wanted to build a concrete shelter when he first began but after discovering what the final dollar figure would be (\$10,000, roughly), he decided to rethink his plans. Limited by his \$3,000 budget, he finally opted to build his shelter from easy to obtain pressure-treated lumber and ½-inch marine plywood. Materials were cheap in comparison to concrete and allowed Jackson to easily build it on site, drastically reducing transportation and fabrication expenses. The only problems were how to design the structural members to bear the three feet of earth that would be covering the shelter and how to prevent water from collecting around it and causing dangerous rotting of the wood.

The first problem required a bit of figuring. In addition to the weight of the yard of topsoil above, Jackson also figured in the effects of overpressure from a 1+ megaton blast on primary targets 8 miles distant, coming up with a nominal figure of an extra 2 pounds per square inch. He then designed his supports to withstand four times that amount. Placing them at 12-inch centers, doubled two-by-fours heavily cross-braced and matched with floor and ceiling joists form a virtual ring of supports satisfying the needed structural requirements. On paper at least, the 16-foot long, 8-foot wide, 7-foot tall module was starting to take shape.

Guarding the wood from rot proved to be less trouble than the structural calculations but still posed its own set of problems. For one, the slope of Jackson's backyard had to be measured to assure that adequate drainage could be provided at the shelter's buried depth and also how the moisture should be collected and disposed of quickly. It was decided that a layer of packed pea gravel beneath the shelter, drained by 4-inch diameter perforated PVC pipes linked to a solid wall drain line of the same material, was the way to go and fortunately his property cooperated, having just barely the drop in elevation needed.

The roof is sloped on one side to

encourage quick runoff, but Jackson realized that even short exposures of the shelter's wooden walls to moisture would prove to be trouble. To prevent this, the drawings called for caulking all seams and applying two heavy coats of exterior polyurethane enamel, followed by liberal coats of spray-on heavy fibrous asphalt and a plastic sheet draped over the module when placed into position. Needless to say, with all this protection it would have to rain pretty hard — flood, actually — to cause water to leak into the shelter via the ground.

Humidity levels within the buried module were taken care of by installing a dehumidifier and blower into the design, powered by DC voltage from

sedged of a main corridor tall enough for a six-footer to stand upright without stooping. Provided with a chemical toilet, several small fluorescent fixtures drawing tiny current loads, ample food and water and a few personal amenities, the occupants are assured of tolerable, if slightly crowded, living conditions.

With most of the obvious design and livability problems solved, all that remained was for Jackson to construct the unit and apply for the proper permits to begin readying the property for installing the shelter. He then had the materials delivered and commenced building the structure in his driveway, a process that involved something on the order of 100 man hours of work



The entry module is positioned next to the shelter.

heavy duty marine 12-volt batteries. They, in turn, would be recharged by a gasoline generator located outside the shelter (heavily shielded with a buried fuel tank) that could be controlled from within. Exhaust air would exit through PVC pipe stacks which would be connected to the shelter by inverted plastic sanitary tees in such a way as to foil any attempt to pour hazardous substances down them by redirecting the danger down past the inlet into a sand absorption bed.

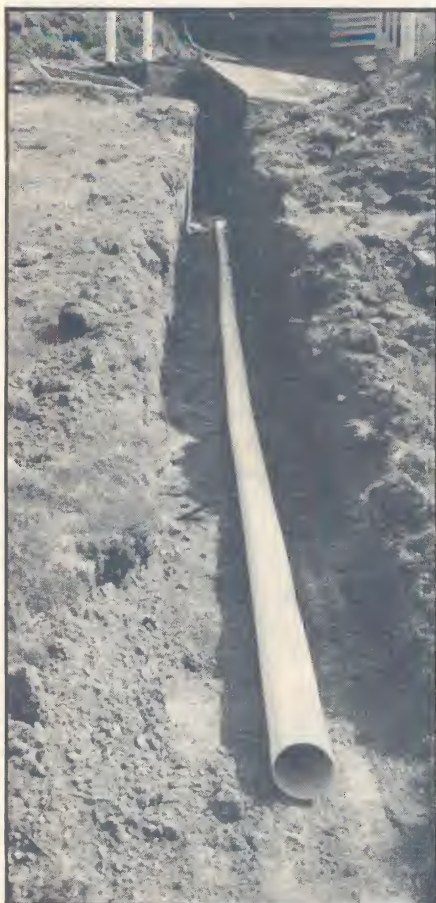
Recognizing that cabin fever is one of the single greatest threats to shelter dwellers, the module is comfortably spacious inside, sleeping four on fold-down beds that double as seats, pos-

with frequent interruptions from curious passers-by.

Things moved along smoothly and soon the second coat of protective paint was dry and all attentions turned to the permits, which had not been approved as yet. When word finally came, it was a crushing disappointment — the permits were denied!

Apparently, the local building department looked down on anyone building a shelter as some kind of kook and did not intend to allow such goings on in their neighborhoods. There was a happy ending, fortunately. Faced with a fancy playhouse in his driveway, Jackson merely changed the title of his permit drawings to say "root cellar"

Low-Cost Underground Shelter



The all important drain line running from the shelter.

instead of bomb shelter and the permits went through in a few days. So much for dealing with stubborn bureaucrats.

Papers in hand, Jackson then hired a backhoe to excavate the hole for the shelter and the drainage trench and followed with a dump truck load of gravel for his drainage system. The piping was hooked up and the moment of truth was at hand just three days later when the time came to lift the module off its blocks and place it into the prepared hole. Groaning a bit under the load, the backhoe gingerly picked up the 16-foot long shelter and with some guidance from workmen, placed it squarely on target. A smaller entry module, similarly waterproofed but not intended to provide radiation protection was then lowered into position and attached to the main shelter by a short tunnel while workers busily attached the air intake unit at the far end of the module. Once the spray-on asphalt and tent of plastic were in place, all that remained was to cover the shelter under its yard of topsoil.

The work crew had gone about a week, during which time the Jackson family busied itself by smoothing and replanting the area again, before anyone dared to look inside to see how the shelter was handling the load of earth. Much to everyone's satisfaction, the

walls were holding fine against the load except for one or two places where a slight bowing had occurred in a wall stud, a problem easily fixed by the addition of some extra crossbraces in the troubled areas. Heavy rains two days prior had not succeeded in crossing the barriers and the unit was quite dry inside, if somewhat stuffy. A quick check of the lighting and blower indicated no problems either, a reassuring fact, and the Jackson's new "root cellar" was stocked and made ready to fulfill its purpose of saving and preserving life.

You would be hard pressed to notice the Jackson's shelter today, now that grass grows on the slope again and newly planted evergreen shrubs are rapidly growing to conceal the exposed portions of the vent and intake stacks. Small modifications and improvements are added from time to time to the interior of the shelter and the Jackson's young son takes great delight in using it for a playhouse when Dad gives the OK.

But regardless of its current uses during peacetime, it still stands ready to help the Jackson's survive and see their way of life and their freedom passed on to future generations. A small investment for such a potentially large return, don't you agree? ●



This is all you see above the shelter now that the earth covering has been landscaped.



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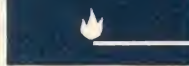


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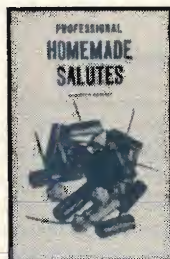
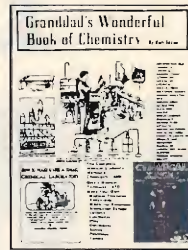
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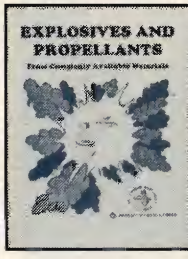
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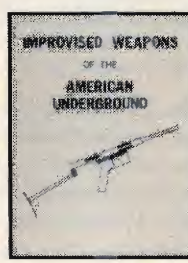
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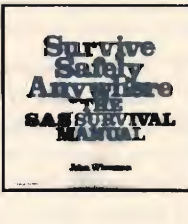
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Self Defense Skills:

Combat Encounters



The attacker steps in to strike with a weapon in his left hand. McSweeney steps in to meet the attacker's forward momentum and delivers a right chop to the vagus nerve.

The author's system of combat karate emphasizes power strikes to a few vital targets. . .

By John McSweeney

John McSweeney is the founder of the Irish Karate Association and holds an eighth degree black belt in the International Combat Martial Arts Federation. He teaches combat karate at his school in Elmhurst, Illinois, and markets a four-video tape series on his self-defense system. For more information, contact McSweeney's Self-Defense, Dept. ASG, P.O. Box 1218, North Riverside, IL 60546 — The editors.

COMBAT karate is oriented towards survival. Practitioners work on developing their self-defense abilities, leaving such things as tournament competition and full-contact kick-boxing to devotees of sport karate. Self defense usually entails meeting violence with violence so the techniques employed are aggressive.

The well known combat karateist Brad Steiner urges his students to "attack the attacker." I agree with him as well as with the military axiom, "the best defense is often a good offense." Close examination of the animal kingdom supports this theory. Tigers and other predators don't waste time on defensive tactics. They simply ATTACK. Sneak up on a lion and see what happens; as soon as he spots you he attacks. The same is true of guard dogs; they defend by attacking. They have only one weapon, their teeth, but they use this weapon so effectively they frighten any unarmed man.

The system of combat karate I teach emphasizes power strikes to a few vital targets. The strikes are designed to stop any aggressor, regardless of his

size. Moreover, through repeated drills, the motor nerves are trained for spontaneous reaction. Most important, my system is based on key lessons I learned from 17 actual encounters. The strikes I used as well as my aggressive tactics worked for me at the time and a review of some of these encounters should be helpful to anyone interested in understanding the principles of effective self defense.

My first encounter was in 1960 after one year of training in Kenpo Karate with Ed Parker in Pasadena, California. I was attacked by a tall, powerfully built man who came at me with a wrench in his left hand. I rushed in on him and struck the side of his neck with a powerful right chop. The wrench flew out of his hand as he fell on his side, momentarily stunned. After a short while he crawled on his knees, then got to his feet and ran away.

He was stunned because I hit his vagus nerve, a knock-out point. The power of the blow was produced by the lightning-like speed of my hand as it described a circle which tended to cut right through the target and the power

was increased by a rapid twist of my waist at the moment of impact. The free-wheeling nature of this circular Kung-Fu chop is completely different from the linear karate chop which hits the target and bounces back. It is also twice as powerful!

The striking surface was not the traditional "edge of the hand" which gives upon impact and thus reduces the shock to the target. Instead, I chambered my hand back towards my wrist to hit with the meaty section at the base of my palm together with the adjacent wrist bone. Since there is no give when striking with this area all the power of the blow is transferred to the target. Because I rushed in, my body-center moving forward added to the force. In addition my rushing in caught my assailant by surprise, "beating him to the punch."

There was no hesitation on my part during the moment of crisis; I reacted spontaneously. Moreover, I thought "only of the cut," the philosophy espoused by the great 17th century Japanese swordfighter, Miyamoto Musashi, and thus wasted no time worrying



Attacker squares off from a distance. McSweeney steps in using a cross-over twist step (right leg over left). The momentum of the cross-over step brings McSweeney's full body weight into the target as he delivers a double-palm strike to the sternum.

about defending myself from the wrench. The aggressive viewpoint, "attack the attacker," was a critical element in this successful defense.

I keep a log of my encounters and so I recall them by number. My 10th was in 1970 at a restaurant in New York City where I was celebrating my 25th anniversary of graduation from high school with fellow classmates.

We were sitting at the bar after dinner when I noticed a strong-looking man grabbing one of my classmates by the collar and about to punch him. I jumped off my bar stool and ran about seven yards towards the assailant who quickly let go of my schoolmate and reflexively turned to face me.

Without breaking my stride I did a cross-over twist step while chambering both hands at my side and then hit the man in the sternum with a double-palm strike. He flew backwards, his body striking an associate. They both landed on the floor, looking frightened. Suddenly another man rushed towards me with both fists clenched. I moved forward to meet him but he stopped his rush before contact range. My fighting spirit was at a peak so I dared him to come on but he backed down, keeping a safe distance from me.

As my classmates removed me from the restaurant he began to shout at me but made no further attempt to fight me. Later one of them told me he was the bouncer and had a reputation for being a tough fighter. Why he backed down is just as important in understanding the principles of combat karate as why two men were knocked down by one blow.

First I will describe the blow, the

double-palm strike. Chamber the weapon at your side, both hands facing each other and slightly apart. Twist your waist so that your chest faces 90 degrees away from the target. Strike forward, turning the hands to hit with the base of each palm and as soon as the arms are fully extended, whip the hands back towards your chest.

Move the body center forward by stepping in with the opposite foot as your strike. Stepping with the opposite foot permits a full waist turn and the resultant torque increases the power. You can also practice this strike while running in order to increase momentum but be sure to do a cross-over step to allow the waist twist. This strike, incidentally, is used by all Tai-Chi masters and is called "uprooting." Many of them can send you flying backwards with only a 6-inch strike and they claim it is their "chi" which produces such dramatic results. There may indeed be a mystical element to "chi" but even without magical enhancement constant practice of the double-palm strike develops awesome hitting power.

Why did the bouncer back down? My anger caused a fighting rage, fully devoid of any fear. He sensed that rage and decided not to engage it. He also saw that two men were knocked down and realized I possessed a certain amount of fighting skill. What caused my anger? Nothing more than the sight of my small classmate being bullied by a much bigger man. In war, hatred is the one emotion that can override fear, so when troops hate the enemy they fight like men possessed. In self defense, controlled anger overrides fear

and motivates you to fight. Anyone who dares to assault you physically, to actually try to harm your only real possession, your body, should cause instant anger.

Even the threat of such an assault on you or anyone dependent on you for protection should cause anger. How much violence you use depends on the situation as well as your level of skill.

My 17th encounter was in 1984 at a night club in Chicago. I had been dancing with a lady friend and as the music stopped, a man about my size punched my shoulder as he snarled "Watch your step, jerk, don't bump into me while I'm dancing." I was surprised since I didn't think I had bumped him so I said "Take it easy. It's a crowded floor — anyone could have bumped you." He probably took my calm explanation and lack of response to his punch as a sign of weakness or perhaps he was trying to impress his lady friend with his toughness but, whatever the reason, he threw another punch, this one aimed at my face. I ducked under the blow and stepped in with my right foot as I hit his lower ribs with a right upward elbow strike. I then grabbed his windpipe with a left eagle's claw and squeezed it quickly as I whispered a threat into his ear.

He coughed to catch his breath and then disappeared from the dance floor. Neither of the two ladies ever saw my strikes since both moves are fast and subtle, designed to attract little notice.

My threat had the desired effect but without the strikes the threat would have lacked impact.

Now I'll describe the blows. The first

(Continued on page 43)



BK&T Corp.:

Machax Survival Tool

*Modern interpretation
of the classic Gurkha Kukri...*

Staff Evaluation



ABOVE — The blade is full tang and ¼-inch thick heat treated chrome-moly steel.

LEFT — The machax comes with a black leather or black nylon sheath.

I want a tool I can use for everything — chopping and whittling as well as a froe, hammer or pry bar,” explains Ethan Becker, president of Becker Knife and Tool Corporation which makes the Machax Survival Tool and a similar knife called the Warrior.

“It is not the best hammer, but the flat can be used for one if needed. It is not the best pry bar, but it works. In its primary uses, chopping and hacking, please note that when it hits it hits dead. There is no ‘machete wrist’ from vibration! You will be able to use the Machax for quite a while before your wrist hurts. One of our guys took a Machax out in the woods and in four hours with the Machax as his only tool he built and thatched a roomy lean-to shelter for two people, a fire frame and reflector, two pieces of camp furniture

and stocked the camp with firewood — and no machete wrist.

“Note also the differential grind on Machax which has more of a slicing angle on the inside of the curve to more of a chopping and splitting angle closer to the tip. We are, I think, the only people who sharpen down close to the grip on a tool like this so that it is easy to use for close-up work.”

The heavy ¼-inch 4140 chrome-moly blade of the Machax borrows the unmatched weight distribution of the Gurkha Kukri knife (which itself is a variation of an ancient design), combines it with fine American steel, full-tang construction and Zytel scales large enough for a good working grip. Weight is 20 ounces.

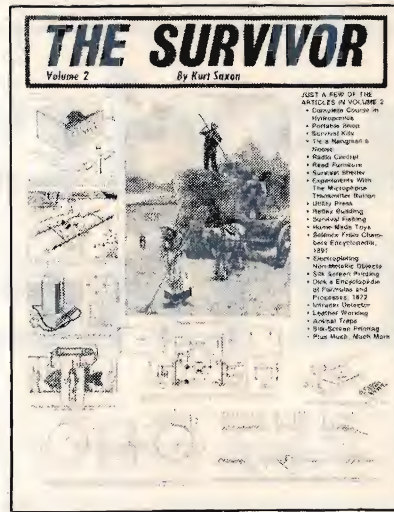
The 4140 chrome-moly steel is moderately heat treated, giving it a very

tough nature. It can be quickly sharpened using a file, stone or rock if need be. It will rust, but it has a rust-resistant phosphate finish except for the edge. A little oil will help prevent corrosion. If the scales or blade are ever broken, BK&T will replace them without question — provided you didn’t do it on purpose. We tried out the Machax in a bamboo thicket and on several types of dead and live trees and heavy brush and found it to be excellent.

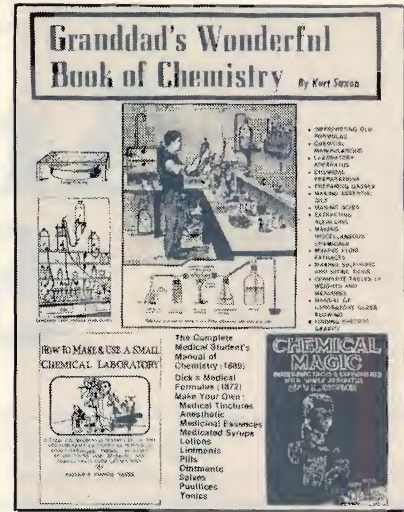
The Machax can be purchased with fine black leather or nylon sheath for \$129 (either sheath alone is \$25) from Becker Knife & Tool Corp., Dept. ASG, P.O. Box 44179, Cincinnati, OH 45244; (513) 231-9446. Ohio residents add 5½ percent sales tax. Also available at better cutlery dealers. ●



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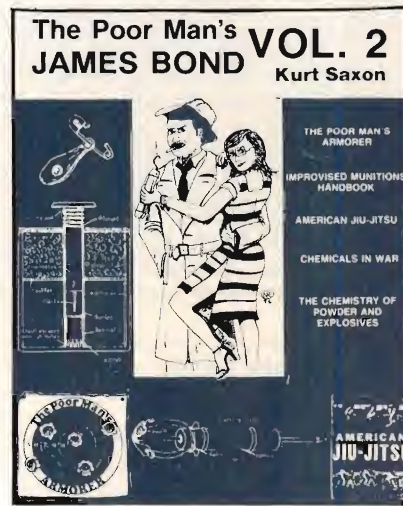
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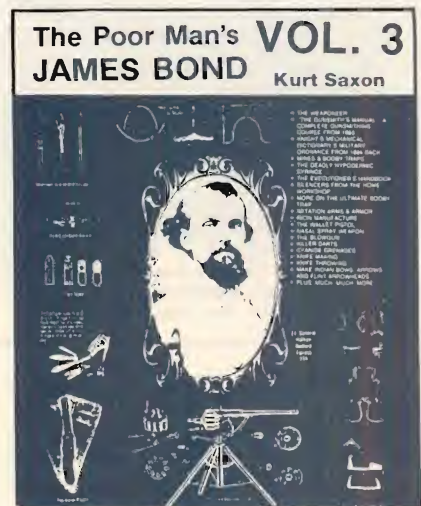
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American Striker

U.S.-made 12-shot, 12 gauge magnum-firing shotgun . . .



Grant Stapleton, LEO president, fires slugs in the fixed stock Striker at a silhouette target about 30 yards distant. The resulting five-shot group is shown here. The slugs were fired fairly rapidly.

By Jim Benson

YOU may have read about the unique, spring motor driven revolving magazine South African "Striker" 12-shot, 12 gauge shotgun.

Due to import restrictions, this weapon is not now available for distribution in the United States. An American-made improved version is now available on the U.S. market, however, and it can fire magnum loads, which the original African gun can not fire.

Made by Sentinel Arms Corporation for the exclusive U.S. distributor, Law Enforcement Ordnance Corporation (LEO), both of Ridgway, Pennsylvania, the American Striker is the same gun as the South African shotgun with some important improvements.

These include a fixing shaft which holds both pieces of the receiver together and prevents flexing with the

firing of magnum loads, stronger construction of the cylinder and charging holes for use of magnum shells, a steel barrel shroud which protects the aluminum alloy barrel, a front sight, a reinforced winding key, and a sliding metal loading aperture cover that does not protrude from the drum magazine.

This new, improved Striker will fire any 2¾-inch shotgun load, including any type of magnum. The magazine holds 12 shots and these can all be fired in three seconds or less if necessary.

"The Striker is probably the fastest shooting shotgun in the world due to its quick action," says Greg Souchik, LEO sales and marketing administrator. He says the Striker is in service internationally with several government security forces in Europe, Africa and South America as well as with

several major U.S. law enforcement agencies.

The gun is loaded and unloaded by means of its winder. With the safety catch behind the trigger pressed to the right of the gun in the SAFE position, the loading aperture cover is lowered and the shotgun is loaded one shell at a time. As each shell is loaded, the winding key is turned to move the drum magazine to the next empty chamber until all 12 chambers are full.

With the winder fully wound and the aperture cover closed (very important to prevent injury), the weapon is ready to fire with the safety catch in the FIRE position. One of the safety features of the Striker is the heavy two-stage trigger. The first stage of the trigger aligns the rounds in the magazine with the firing pin. The second stage of the trigger drops the hammer which drives the



Stapleton demonstrates firing the Striker with one hand. This photo shows recoil just after discharge.



Greg Souchik, LEO sales and marketing administrator, fires the Striker with optional folding stock.



Here Souchik extends the folding stock and fires the Striker from the shoulder.



Loading and unloading the Striker.

firing pin into the primers of the shells. This way, until the trigger is pulled the magazine is always out of line with the firing pin and barrel. If the gun is dropped it will not discharge.

After firing, the winding key is again used, along with the ejector lever located on the right side of the barrel next to the front sight, to unload the empty shells from the drum magazine. With the safety on and the barrel pointed in a safe direction, the winding key is again turned to move the cylinder until all empty shells have been ejected. The weapon is then ready for reloading.

Stripping for cleaning and maintenance requires the use of 4 mm Allen wrench (not included with gun). Cleaning is recommended after 2,500 rounds have been fired in the shotgun.

It is made to U.S. military speci-

cations and will function in extreme cold or heat, blowing dust, snow, rain or other weather conditions, according to LEO officials. The U.S. Striker has a computer projected life expectancy of 300,000+ rounds (even magnums). "We've run 30,000 rounds through one gun without cleaning it and it's still functioning flawlessly," says Souchik.

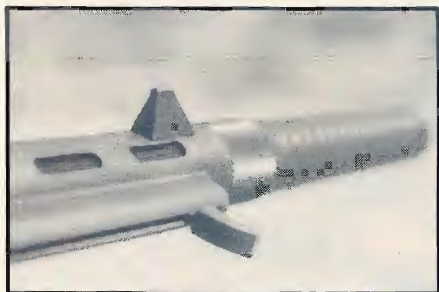
With practice, the Striker can be loaded and unloaded rapidly. Souchik, and Grant Stapleton, LEO president, say they have fired all 12 rounds in 1.7 seconds, but three seconds is an average for rapid fire.

The frame of the matte black finished Striker is ordnance grade steel. The barrel and cylinder are a very tough heat treated aluminum alloy. The Striker comes with a fixed stock and pistol grip of 50 percent long fiber polycarbonate resin. An optional folding

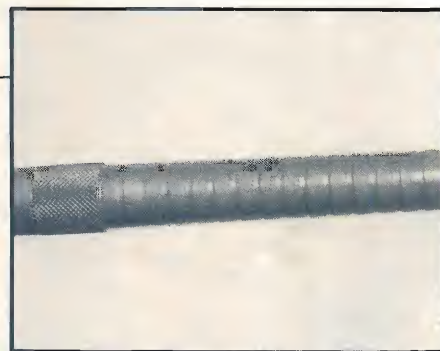
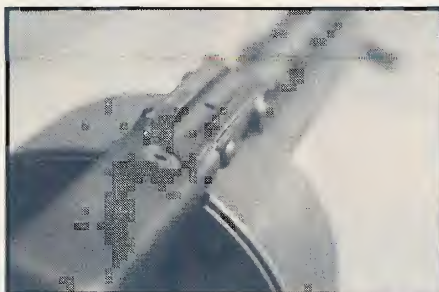
steel stock can be purchased for the shotgun, as well as an Armson OEG red dot sight, nylon carrying bag, adjustable nylon web sling and ballistic nylon vest which carries 48 or more 12 gauge shells concealed behind removable velcro panels. LEO, which markets the Striker and accessories for it, is the patent holder for the U.S. made Striker and was the only authorized importer of the South African Striker before import restrictions were imposed.

Field Testing — The ASG staff traveled with Greg Souchik and Grant Stapleton to a public shooting area in the mountains of Southern California to test shoot one of the new U.S. Strikers. We brought along some Remington Express Long Range No. 2 Shot loads, Winchester Super-X Hol-

American Striker



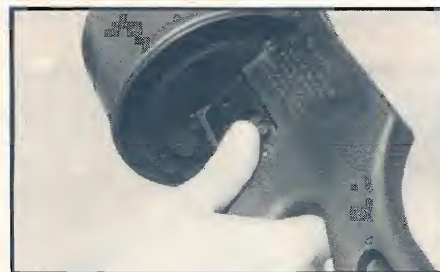
The front and rear fixed sights.



The steel barrel shroud protects the aluminum alloy barrel.



ABOVE & UPPER RIGHT — The optional ballistic nylon vest carries 48 or more rounds and other gear and has concealable, removable panels.



The safety catch is pushed to the right to engage the safety.

low Point Rifled Slugs, Federal No. 4 Magnum Buck Shot and Magnum 00 Buck Shot.

We fired all of our ammunition, approximately 100 shells, and experienced no malfunctions. Moreover, the Striker exhibited excellent accuracy firing at targets about 30 yards distant. We fired the gun from shoulder and hip with the fixed stock and folding stock. Recoil, while definitely noticeable with the magnum loads, is not excessive. With lighter loads recoil would of course be even less. The 10+ pounds weight of the shotgun when fully loaded keeps recoil down. It is easy to handle and operate, although the strong, two-stage trigger pull requires some getting used to. LEO offers two models of the Striker, its Sporting model with 18-inch barrel, shown in the photos accompanying this article, and a Police model with 12-inch barrel.

Like its predecessor, the American-made Striker is an innovation; it's

Striker Sporting Shotgun: Tech Specs

Operation	spring motor driven revolving magazine (clockwise rotation)
Caliber	12 gauge x 2 ³ / ₄ " only (including magnums)
Capacity	12 rounds
Lengths:	
With fixed stock	36 inches
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Safeties	trigger lock catch, firing pin out of line with shotshell primer
Rate of fire	12 shots in 3 seconds
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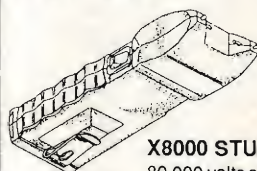


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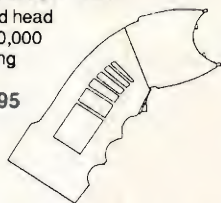
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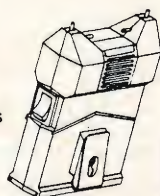


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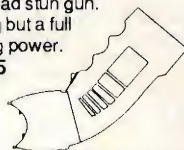


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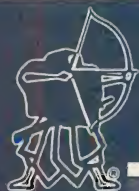
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Brigade Quartermasters



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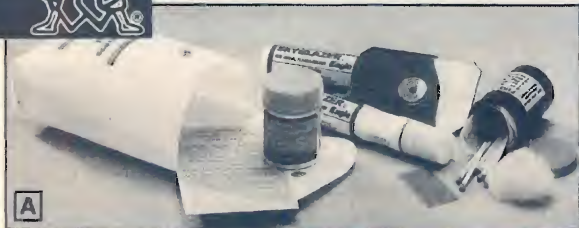
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M11760 \$58.95

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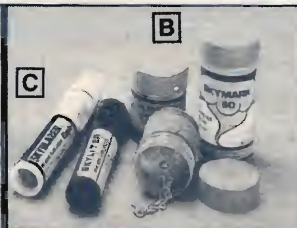


Brigade Quatermasters



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1. Visible for many miles at night
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Xenon lamp module produces a brilliant light and flashes 24 hours. High visibility orange case features heavy duty "safety pin" holder. (Battery not included). Made in USA. [4 oz]
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Internationally known lifeboat signal. Simple plastic design has no moving parts to jam or break. Made in England. Two per pack. [2 oz]
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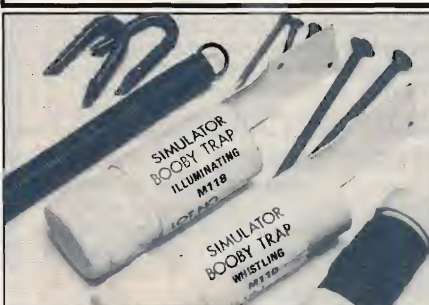
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SDU-5B, Firefly Mercury Battery \$14.99
SDU-5C, Firefly LC2 Nylon Pouch \$5.95

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GI ground flare ignites instantly when the trip wire is activated. Burns brightly for 20 to 28 seconds. These are excellent perimeter warning devices for anti-intrusion. Mil-spec new manufacture. Pack of 5. Instructions included. UPS only. [1 lb 4 oz] Adults only
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Combat Encounters (Continued from Page 33)

strike, the upward elbow, gets its power from the circular motion of the elbow, forward and up. The striking surface is the point of the elbow. The elbow is the body's second most powerful natural weapon (after the knee) and its force was increased by the momentum of my entire body weight as I stepped forward. Had I hit with full force I would most likely have broken one or more of his ribs. Since my intention was only to shake him up I hit with less than full force.

The second strike, the eagle's claw, is formed by thumb and index finger. Strike forward like a snake and grab the back of the larynx, behind the thyroid cartilage. Squeeze the two fingers together to control and immobilize your opponent. Maintaining this tight squeeze while pulling back rapidly destroys the breathing structure and causes almost instant death.

These two strikes, together with the threat, took the steam out of a would-be tough guy and caused him to retreat. Psychology, expressed in words or in attitude is an important part of effective self defense and the psychology behind my threat influenced his decision to retreat rapidly.

If you analyze the three encounters I just described certain principles of combat karate spring forth:

1. **Spontaneous reaction to an attack.**
2. **Powerful strikes to key targets.**
3. **Proper use of body mechanics to develop optimum striking power.**
4. **Controlled force to obtain desired results.** (e.g., in the first encounter I hit the vagus nerve rather than the Adam's apple. Had I hit the Adam's apple with this much force I might have ruptured it, causing death. In the third encounter, I hit the ribs with less than full force and I did not pull the windpipe out.)

5. **Accuracy of Strikes.** Because of constant, repetitive drill I had developed my accuracy to a very high level.

6. **Aggressive response.** I "attacked the attacker."

7. **Use of Psychology.** I knew when to threaten with words and I had conditioned my mind to respond with instant anger whenever anyone attacks me or anyone dependent on my protection.

Using those principles will help you to survive if you ever have to put your life or the life of a loved one on the line. ●



McSweeney ducks under the punch in a low horse stance.



McSweeney pivots into a right bow and arrow stance while striking the ribs with an upward elbow blow.



After the elbow blow the left hand delivers an "eagle's claw" to the thyroid cartilage (use extreme caution).

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The Pocket Filter is standard issue with the International Red Cross and NATO. Essential equipment for backpackers, globetrotters and survival kits. Built-in pump produces 1 quart/minute of safe drinking water. Includes carrying case, cleaning brush and instructions. 10" long, 2" diameter, 23 ounces. Full money-back guarantee.



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Stay warm and comfortable in below zero conditions by using the layering system.

By Scott Stoddard

I was taught the layering system years ago when I first got into backpacking. It's a very old idea to wear lots of clothes when you are cold and remove them layer by layer as you get warm. We used some fairly inexpensive and basic garments for our layering system in the beginning. The basic outfit consisted of: waffle-type long Johns, wool shirt and wool pants from the Army/Navy surplus store, a wool sweater and cap, a down vest when we weren't hiking, and a windbreaker or

60/40 wind parka with hood. A poncho was also handy in the event of a mountain thunderstorm.

How does our "basic outfit" compare with what's available today? The modern-day layering system uses the same basic ideas as the old, only the fabrics and materials used today are lighter and less bulky and warmer when wet.

Mountaineers experience extreme differences in temperature. While on a trip up Mt. Whitney, elevation 14,495 feet, we were base camped at 12,000 feet

in an area resembling a lunar landscape devoid of trees and most plant life. During the day the temperature inside our dome tent was well over 110 degrees. Nearby in the shade of a granite outcropping the thermometer read 55 degrees. That night the mercury dipped to 12 degrees Fahrenheit.

The layering system allows you to regulate and compensate for two factors involved in your outdoor comfort. The first is the *outside* environment including air temperature, wind and



Lightweight polypropylene underwear and a shell jacket might be all that is required during heavy exercise. Extra layers should be stowed in a day pack should conditions change.

possible wetness. The second involves your *inside* environment — the amount of heat your body produces through chemical reactions in your muscles and the amount of moisture produced to cool that excessive heat.

Physical exertion with too many clothing layers will cause the inside temperature to rise to uncomfortable levels causing lots of perspiration. Too few layers with little or no activity and your body becomes chilled. The blood is constricted to the body's core leaving the fingers and toes with little warmth. Shivering begins in an effort to create more heat.

Clothing does nothing to create warmth. It only serves to dispense or conserve the heat your body produces. With today's modern materials clothing can also be used to keep your body dry. Not only from the outside effects of rain and snow, but from perspiration caused inside by physical activity. New fabrics are being invented that can wick away this moisture from your skin and prevent the rapid cooling that evaporating moisture causes. Other materials are being made for improved insulation qualities and wind and rain protection.

It is useful to classify clothing in four layering categories, according to their principle function: (1) The underwear layer for maintaining a comfortable climate next to your skin; (2) the insulation layer for keeping the heat in; and (3) the shell layer which protects against wind, rain, snow and sun.

Underwear Layer — I used to think long underwear was used mainly for increased warmth, especially when out

in the snow in frigid weather. Before high-tech synthetics, we would wear cotton-waffle long johns. As long as we were dry this was O.K. but get wet or start to sweat and say good-bye to warmth. Cotton is one of the worst fabrics to wear in the winter. Cotton loves water and sucks it up like a thirsty camel in the desert. It takes forever to dry and wet cotton sticks to the skin, conducting heat away from the body and forcing evaporation to occur right at the skin's surface. Your best bet is to save cotton for the hot summer or your next trip to the tropics.

Wool is even more absorbent than cotton, however, wool doesn't collapse when wetted so it still provides insulation in wet environments. Like cotton, wool dries very slowly. Although wool is a good natural material for winter clothing, it is not a good choice for underwear. Many people can't stand its itchy texture next to the skin.

The only other natural fiber used for winter underwear is silk. Silk feels wonderful next to the skin and provides more warmth than any other natural fiber except wool. The drawbacks are its price and its slow drying time. If you don't plan on perspiring heavily, silk would be a good choice if cost isn't a problem. It wicks away moisture and reflects body heat quite nicely.

The synthetics are the most functional and probably the best winter underwear available. All are variants of polyester and are made to wick moisture from your skin. The wicking

process subtracts moisture without subtracting heat the way evaporation does. The fabric spreads the moisture over a larger area where the air can get to it.

Polypropylene is perhaps the best known of the synthetics. It dries very fast and won't cling to the skin when wet. One of the disadvantages of polypropylene is its low melting point, which means it must be washed in cold water and line-dried to avoid shrinkage. Also, it is an oil-loving material. Oil and dirt tend to want to stick around even after washing, so this underwear begins to smell after a few days in the field.

A new generation of polypropylene has been designed with some of these disadvantages removed. Lifa Prolite 5000 is one of these. It can be run through both the washer and dryer and will not retain odors. With more fibers in each strand of yarn the result is a softer and more durable fabric.

Capilene by Patagonia is another improved synthetic. Capilene polyester wicks moisture off the skin better than silk, wool, and even polypropylene. The fibers are constructed so that water will climb between them (capillary action).

It also wicks through "spreading action." The water molecules are attracted to the molecules in the solid fabric. Instead of beading up, it spreads out and dries faster. Capilene doesn't stain and it resists perspiration oils. It remains soft and pliable and can be laundered at any temperature.

(Continued on page 48)



Capilene long underwear, a wool shirt, fleece jacket and a 60/40 jacket make up a good layering outfit.

Saxon Arms:

The Avenger



A lightweight crossbow with power and reliability. . .

Staff Evaluation

THE Avenger crossbow by Saxon Arms Inc., has an all aluminum alloy frame construction making it a light and comfortable crossbow to take out into the field. With its standard bipod cocking stirrup, we found the Avenger's full 150-pound draw weight was quite manageable and its fiberglass prod delivered lots of punch.

The sighting system consists of an adjustable front pin and a rear sight with rotary click-stop controls for windage and elevation. After only a few minutes to adjust the sights and get used to the trigger pull, we were able to make consistent hits on our target



The Avenger crossbow weighs in at only six pounds, two ounces. Overall length is 31 inches.



ABOVE — We found that recoil was slight but that the bolts hit the target with considerable force.

RIGHT — The front pin sight is adjustable for elevation.



BELOW — The rear sight has click-stop adjustments for both elevation and windage.



Two dead-center hits illustrate the Avenger's accuracy.

placed 30 yards away. We were very pleased with its performance. The string shows almost no perceptible wear and when fired there was little noise or vibration.

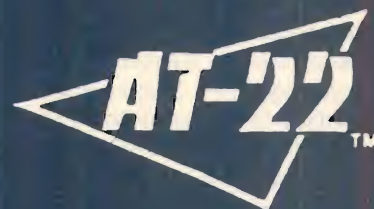
Other important features include an automatic safety catch, tough non-chip paint, and an optional scope available. A folding stock model is also ready for sale. The Avenger would make a fine sporting and hunting weapon and is available for \$175 from Saxon Arms Inc., Dept. ASG, 615 Jasmine Avenue North, Suite "J," Tarpon Springs, FL 34689; (813) 938-4882. ●

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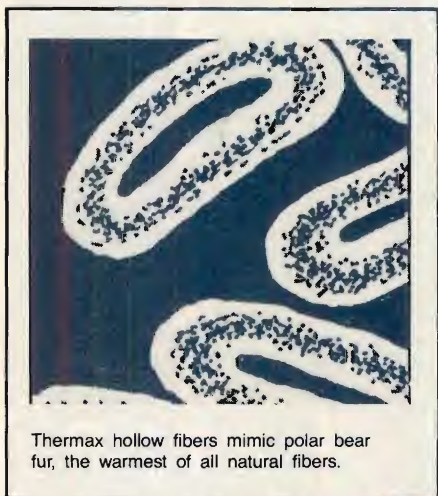
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Cold Weather Layering

(Continued from page 45)



Thermax hollow fibers mimic polar bear fur, the warmest of all natural fibers.

Du Pont has come up with a new fabric, Thermax, with fibers patterned after polar bear's fur, the warmest of all natural fibers. Thermax fibers are hollow and also crimped. They don't bunch together and so excess body heat and sweat move easily through the fabric. It is probably the most breathable underwear on the market — a very good choice for runners or cyclists who train on colder days.

When buying underwear for your layering system, be sure to buy the tops and bottoms separately to be sure of a good fit. Another problem with all long underwear, especially when worn under knitted or woven pants, is its tendency to bind. By wearing a pair of nylon-Lycra tights against your skin, you will reduce the friction of underwear against skin, and also add a little more warmth.

Insulation layer — The natural fibers for suitable winter insulation include wool and goose down. If you don't mind the moisture loving qualities of wool, a few Pendleton shirts and some wool sweaters make nice insulating layers for your winter clothing system. What you don't want to do is spend a lot of money on a fat, high-loft goose down jacket. Instead of being able to regulate your temperature by removing layers, a big down jacket will leave you cooking inside, or after removing it, chilled to the bone. I recommend down for non-activity periods like cooking or wandering around camp. The lesser thickness of a down sweater or down vest would be more suitable for hiking or cross-country skiing.

Natural goose down is one of the best insulators. It is extremely light

and it can compress into a very small space. When wet though, it loses a great deal of insulating ability. Be sure to dry down sleeping bags and clothing in the sun so that consecutive days of winter perspiring won't begin to catch up with you.

Companies like Du Pont and 3M have been designing synthetic insulating fibers for years. One of my first sleeping bags was made with a synthetic called Dacron 88. Later on PolarGuard was invented. PolarGuard does not collapse like down when wet. It offers more protection than down when damp, but if soaked — forget it. The effect of evaporation will completely overwhelm any residual insulation provided by the PolarGuard. The key to any insulation layer is to keep it as dry as possible.



Wool shirt, pants, cap and gloves are good insulators. A lightweight down vest provides additional warmth.

Other fibers that have been developed are Hollofil 808, Hollofil II and Quallofil. These fibers have holes running down their entire length that provide insulation. While Hollofil has a single hole, Quallofil has four holes running down its length making it more thermally efficient than Hollofil II on a weight basis. None of these fibers absorb water into their holes. Quallofil seems to be the best design yet. The four hole construction allows the fiber to be crimped differently than Hollofil, giving Quallofil better drape and compressibility.

Synthetic fabrics have been developed that have a high warmth-to-weight

ratio, absorb little water, dry very fast, and are quite soft. Polyester pile, first used by Scandinavian fisherman, is made by blowing slivers of loose fiber into a coarsely woven backing material. The slivers form loops and slightly raised surfaces that trap warm air. Patagonia has a new pile called Retro Pile. It doesn't pill as badly as their old pile jackets although it does clump. With the shaggy side on the outside you end up resembling a mature sheep.

Fleece is a similar fabric but with the fibers all woven in. It is not as warm as pile and it won't pill like pile does. Synchronia by Patagonia, Polarplus Fleece from Marmot, Armadilla PolarPlus Fleece from The North Face and Chinella from Walrus are all similar products.

Shell Layer — To combat the hostile effects of wind, rain, and snow, you need a good shell garment that repels water and prevents the wind from stealing away your inside heat. A truly waterproof shell will keep the water out fine, but it also keeps moisture in. Begin to hike or work in a completely waterproof jacket and soon it will feel like the everglades inside.

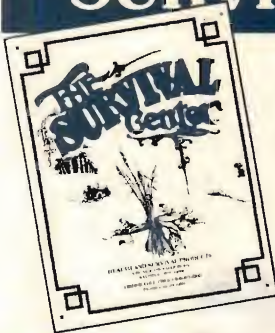
In an attempt to overcome this problem, Gore-Tex was invented. There were early problems with its design but now it seems to do a good job of keeping you dry. Gore-Tex contains 9 billion pores in every square inch of fabric. The microscopic holes are too small for water drops to enter and are offset to prevent wind from rushing in. At the same time, perspiration vapor can escape naturally through the fabric and keep you comfortable.

While Gore-Tex is the ultimate in high-tech shell material (NASA uses Gore-Tex in its spacesuits) many people favor the simplicity of waterproofed fabrics and ventilation systems using zippers and velcro to control inside moisture. Coatings such as Du Pont's Zepel and Patagonia's SealCoat when applied to tough nylons will totally block water droplets and water vapor.

Patagonia has also come up with coatings that try for the "breathable/waterproof" ideal. H₂NO, H₂NO Plus, and H₂NO Storm are coatings — a mixture of chemicals with characteristics similar to Teflon that are applied wet. As it covers the surface, it foams, causing microscopic bubbles that evenly

(Continued on page 66)

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ALL of our products are packed in the finest cans available, enameled inside and out to protect against rust, then nitrogen flushed to protect the contents. We use only the finest air dried foods," says Jay Tims, owner of Harvest Valley Foods in Salt Lake City.

Harvest Valley, through its network of dealers, offers a large line of low moisture, long-term storage foods, including year's supplies and 72-hour food units and other food and survival products.

"Nothing lasts forever," Tims says.

"It's always much easier to replace a can of egg mix once a year than to let your food storage sit for 30 years and find that it will no longer fill your needs because of age, or that you don't know how to use it." Tims and his wife Debra recommend that people rotate their storage food supplies as needed, consuming those items that will not keep any longer and replacing them with fresh items.

How long will Harvest Valley storage foods last? "A lot depends on your storage practices and how you care for your food. Always try to keep your food



ABOVE — Some of the storage foods available from Harvest Valley.

LEFT — Jay Tims of Harvest Valley Foods stands next to the Deluxe One Year storage food unit.

Staff Report

at 69 degrees or less."

All vegetables and fruits should last 10 to 15 years and dairy products, egg mix, non-fat milk, margarine powder and cheese blend should last 6 to 9 years, according to Tims. There are specific recommendations for storage life and use of other food items Harvest Valley offers, such as its granola (5 years).

Harvest Valley has a 9-case year's food supply unit and a deluxe 11-case year's supply unit. There are also 72-hour emergency supply items including survival candy, Spark Lites, water jugs, camp stoves, an emergency radio and 72-hour kit and family instruction book.

Harvest Valley Foods is seeking new customers and dealers. For information on where to purchase their products or on how to become a dealer, contact Harvest Valley Foods, Dept. ASG, 266 East, 500 South, Salt Lake City, UT 84111; phone (801) 363-9103. ●

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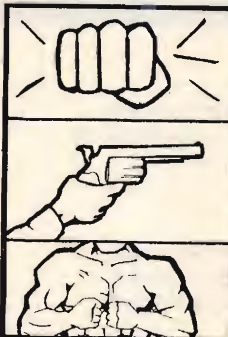
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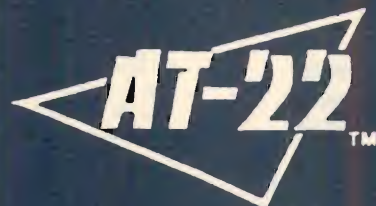
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PRIZE NO. 1

TZ-75 Series 88 9mm Parabellum (NATO) semi-automatic pistol from F.I.E. Corp., Dept. ASG, P.O. Box 4866, Hialeah, FL 33014; (305) 685-5966. The TZ-75 Series 88 is a redesigned, upgraded version of F.I.E.'s popular TZ-75 9mm auto pistol which itself is a variant of the famous Czech CZ-75 pistol. With a slightly different shape and heavier with stronger steel than used in the original TZ-75, the Series 88 pistol has a frame mounted sear locking safety permitting the gun to be carried "cocked and locked" with a round in the chamber. There is also a Colt style automatic firing pin locking safety in the Series 88. Its barrel swells at the muzzle, improving lock-up and overall function and facilitating threading to accommodate a muzzle compensator. Grips on this gun are rich walnut but also available are rosewood, ebony micarta, black checkered rubber, checkered, smooth or scrimshawed ivory polymer. The Giveaway gun finish is satin blue. Other finishes available are matte chrome and combination chrome frame and blue slide. The Series 88 is made by Armi Fratelli Tanfoglio SPA of Italy for F.I.E. Retail value about \$450.



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PRIZE NO. 3

The Tigershark bowie knife from SOG Specialties, Dept. ASG, P.O. Box 1006, Santa Monica, CA 90406; (213) 451-4292. Ground from a select high carbon stainless steel custom smelted and rolled for SOG Specialties, the 9-inch long, .250-inch thick blade of the Tigershark combines handsome grind lines and custom quality rolled edge with faceted reinforced tip. Heat treated to a Rockwell hardness of 55-57, the blade is easily honed regardless of environment. The handle is molded Kraton and completely surrounds the tang. It has ribbed finger grooves and checkering to ensure a firm grip and includes a lanyard hole. The knife comes with the elegant, very strong black leather sheath shown and carries SOG Specialties' lifetime guarantee of satisfaction. Value is \$140.





Indigenous Survivors:

The People of the Blue Creek

2

1. Havasu Falls is located about two miles northwest of the village of Supai.

2. From the canyon rim at Hualapai Hilltop the trail leads eight miles through barren desert before reaching the village.

3. Pack trains are often encountered as you make your way down the narrow canyon.

4. A Supai packer, lariat in hand, drives his horses up the canyon trail.

5. Camp fires are not permitted in the campground. Backpackers will need to bring chemical stoves to heat their food.

6. Mooney Falls and the surrounding canyon viewed from the cliff's edge.



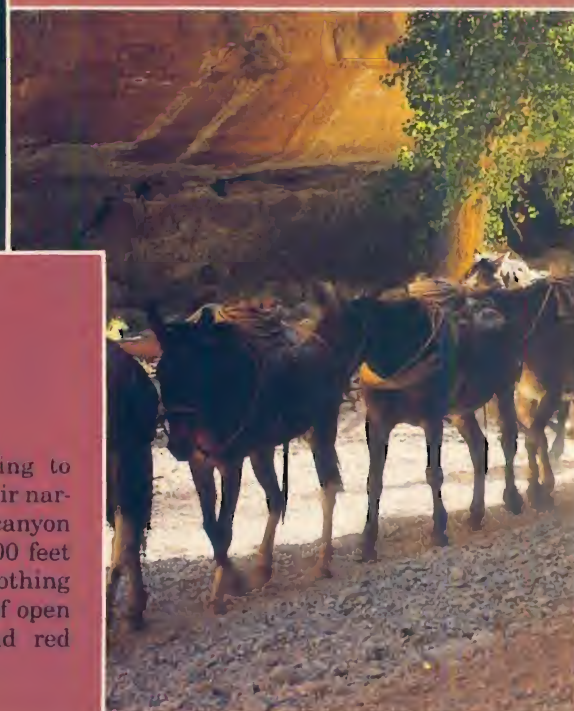
*Hidden canyons, Shangri-la waterfalls,
and the Havasupai tribe...*

By Scott Stoddard

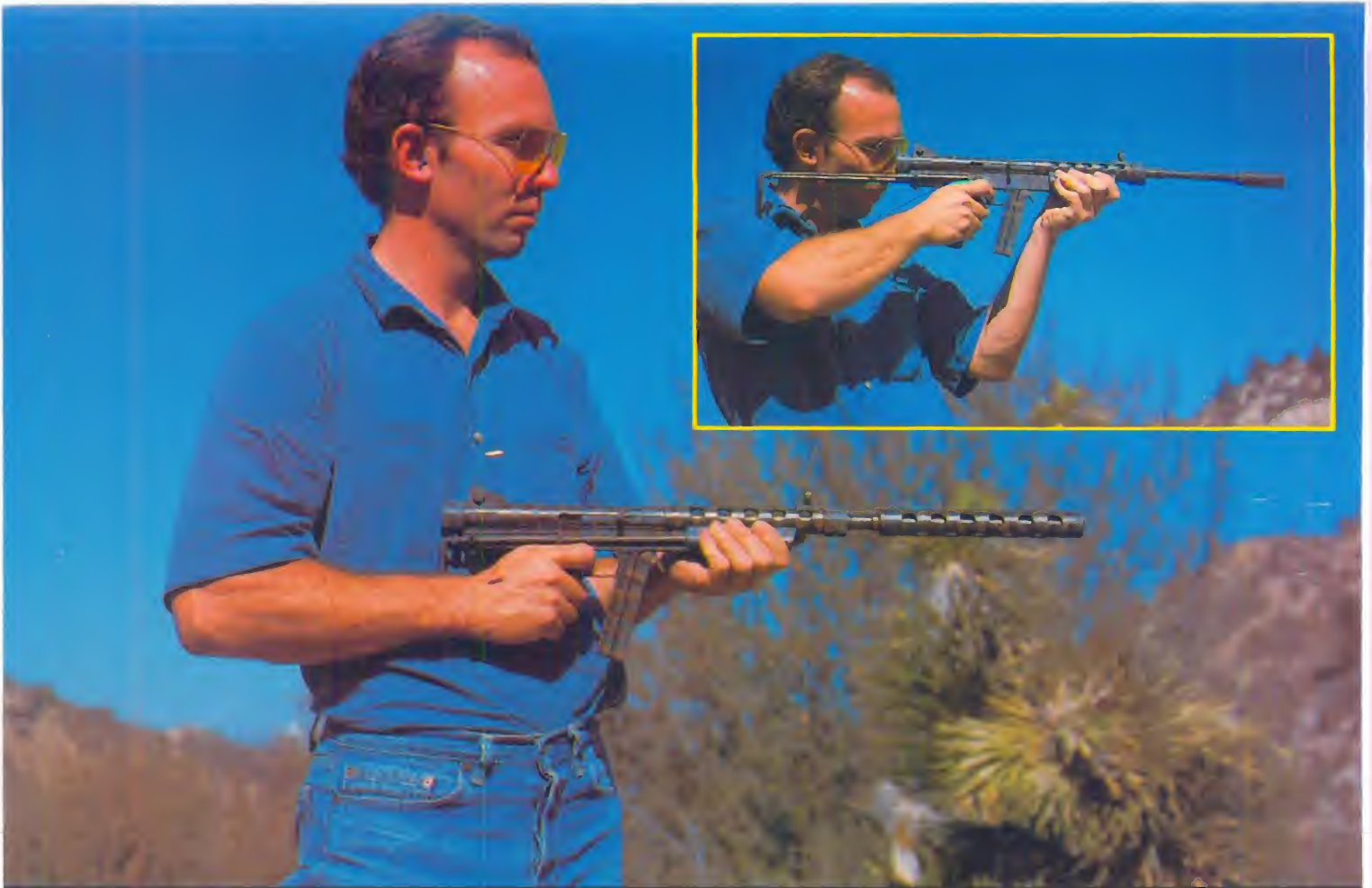
Hidden amid a wilderness of rock, river cut plateaus and narrow gorges found to the south of the Grand Canyon, live a small tribe of Indians known as the Havasupai. The word *Havasupai* means "the people who live at the place which is green." It is often translated as the "the people of

the blue-green waters," referring to the creek that flows through their narrow canyon. Standing on the canyon rim, eight miles away and 3,000 feet above their village, you see nothing but an arid, desolate expanse of open space, sun bleached cliffs and red sandy washes.

(Continued on page 60)







ABOVE — The KG-22 is fired at chest level with stock retracted and the barrel fitted with optional ventilated shroud. INSET — With the standard muzzle end attached to the barrel, the KG-22 is fired from the shoulder with stock extended.

BELOW — The KG-22 is identical to its predecessor, the AT-22, except for the Kal-Gard dry-lube coating of the KG-22 parts and camouflage, tiger stripe-type paint finish. All parts of the two guns are interchangeable.



Feather Industries:

KG-22 Carbine

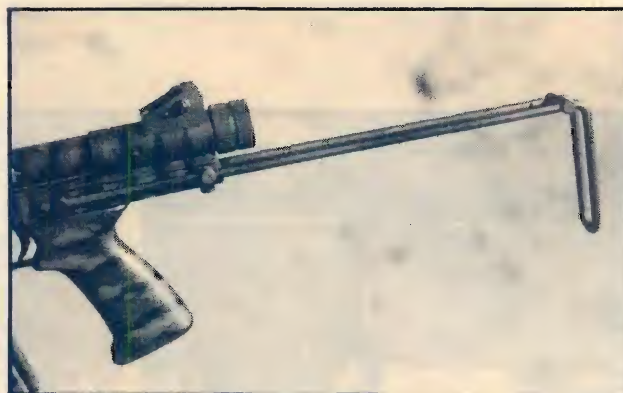
*No-lube, camouflage version
of the AT-22 rifle. . .*

Staff Evaluation

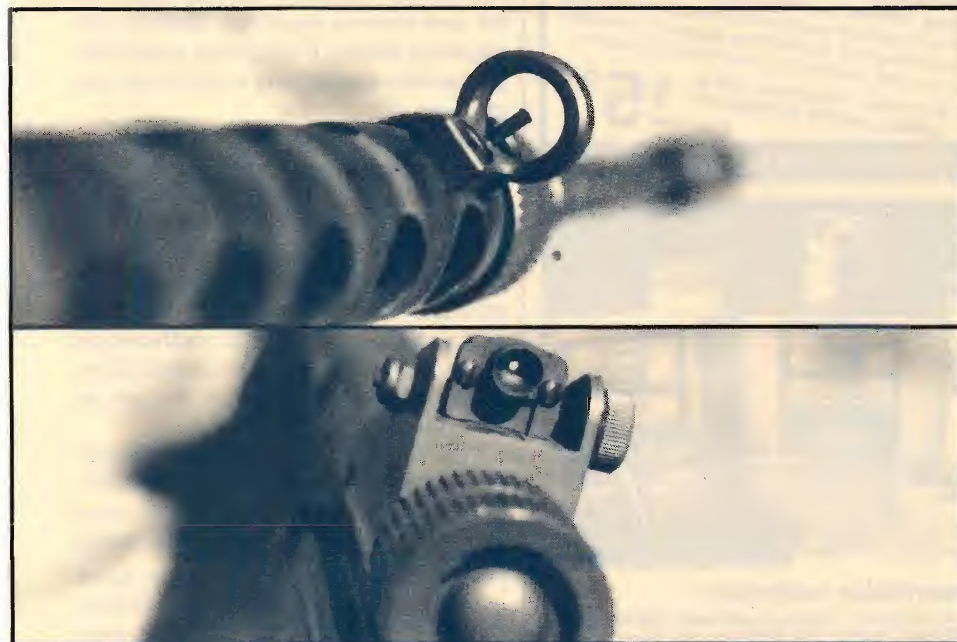


RIGHT — The barrel is threaded at the muzzle and the standard muzzle end can be removed and replaced with an optional ventilated barrel shroud (retail price is about \$44).

LEFT — Among the optional equipment available for the KG-22 is the ventilated barrel shroud and padded camouflage nylon carrying case.



The wire stock, when extended, adds 9 inches of length to the KG-22.



The front sight is a post with protective ring. Rear sight is a click-adjustable aperture.

WHEN we reviewed the AT-22 .22LR carbine in this magazine three years ago (December 1985) we found it to be a lightweight (3.25 pounds empty), well made, accurate and reliable weapon which fires all types of .22LR ammunition.

We're pleased to announce that this same carbine is now available with all of its parts treated with the patented "Kal-Gard" no-lubrication finish and the outside surfaces have a tiger stripe-type camouflage pattern paint which has been mixed with the Kal-Gard finish.

The KG-22, as it is called, is identical to the original matte black finished AT-22 except for the dry lube process used on the parts and camo paint. All parts of the two guns are interchangeable.

The receiver is precision machined

KG-22 Carbine



The safety is a military type designed for quick disengagement. When in the SAFE position it can be felt as you attempt to engage the trigger. A flick of the finger moves the safety lever to the FIRE position, shown here.

KG-22 Carbine: Tech Specs

Caliber	.22 Long Rifle
Operation	blowback
Type of fire	semiautomatic
Lengths:	
Stock retracted	26 inches
Stock extended	35 inches
Barrel	17 inches
Weights:	
Empty	3.25 pounds
With loaded magazine	3.5 pounds
Magazine capacity	20 rounds
Sights	front ringed post, rear adjustable aperture
Price, suggested	\$299.95
Manufacturer	Feather Industries, Inc.,

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from aircraft aluminum. The barrel is removable and the weapon will store in a space only 17 inches long. The weapon strips and reassembles in seconds without tools.

The Kal-Gard dry lube finish is also used on parts of the U.S. space shuttle, according to Merv Chapman, president of Feather Industries, Inc. of Boulder, Colorado, which makes the AT-22 and

KG-22. The Kal-Gard finish process differs from other dry lube type finishes in that it is much stronger, says Chapman, and it will last much longer.

All parts of the gun, inside and out, are dipped in the Kal-Gard chemicals and then baked. It requires tremendous pressure to remove the finish and it should last a lifetime, according to Chapman.

With the Kal-Gard finish, the gun is cleaned with a standard solvent or soap and water and then wiped dry. That's it. There is no oil of any type used. Since no oily substance is used to lubricate the parts, they perform better and there is much less fouling and jamming during firing since unburned gunpowder cannot mix with the oil and gum up the works.

Taking the KG-22 to a public shooting area we loaded up with some Winchester Super-X high velocity and PMC Zapper standard velocity .22 Long Rifle ammunition and tried the gun out on targets about 25 yards distant. We went through several boxes of ammunition and never encountered a malfunction of any type. The gun performed flawlessly, and we found it to be just as accurate as the AT-22.

The KG-22 has a suggested retail price of about \$60 more than the standard AT-22 but you are paying for that great dry lube finish and camo paint job. We think the difference in price is well worth it. Ask your gun dealer about the KG-22 and look one over. You'll like what you see. ●

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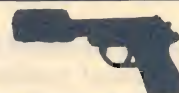
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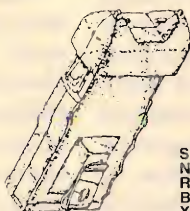
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The People of the Blue Creek

(Continued from page 54)

Riding down on horseback or back-packing down on your own two feet is the only way to get to the remote village of Supai. From the rim, a long, weary trail follows a dry wash down through red sandstone walls and eventually connects to Cataract Canyon. It is near this junction where springs of water bubble up from the gravel marking the birth of Havasu Creek.

As if by magic the bleak dry desert is transformed into a green oasis. The cottonwoods flicker their leaves as the river gurgles and ripples past the garden plots and pastures of Supai village. The water temperature maintains a constant 70 degrees and a high mineral content gives it a blue-green color.

Because the village is surrounded by a double row of cliffs several hundred feet high, pack animals and helicopters offer the only transportation into the settlement. The only vehicle in town is a tractor. Horse traffic is regulated by a sign posted near the Havasupai Tourist Enterprise office which reads, "Speed Limit 10 MPH." Besides the tourist office, the main buildings of the settlement include the tribal grocery store/post office, the cafe where you can get an ice cold lemonade, and the grade school. The remaining lands of Supai are dotted with wood-frame houses, pasture and garden plots.

Continuing the hike down the narrow canyon from Supai, a series of waterfalls with emerald and turquoise colored pools are sheltered by cottonwoods and willows. Navajo Falls, the first of the series is overgrown by thick, almost jungle vegetation: ferns, snarling tree roots, mosses, and a multitude of willows.

Havasus Falls, by far the most inspiring of the falls, thunders 100 feet into an enchanting blue-green pool. Here the water's carbonate of lime content has formed cascading jacuzzi pools that are very popular with tired backpackers.

Havasus creek continues on for another half mile past the campground until you come to a two hundred foot precipice where Mooney Falls plunges in an unbroken sheet of water. The deafening thunder and the clouds of spray do plenty to intimidate those descending the limestone cliffs. The Indians named the falls "Mother of the Waters," but the official name comes from prospectors who long ago watched an adventurer named Mooney attempt-

ing to descend the precipice hand under hand on a rope. He became giddy and fell to his death on the rocks below. Today a trail takes you down through two short tunnels and with the help of anchored chains it is possible to safely reach the basin pool below.

From Mooney Falls the hike is another 10 more miles through dense vegetation and multiple river crossings to reach the Colorado River and the heart of the Grand Canyon. The Havasupai seldom traveled past the "Mother of Waters" believing that spirits of the dead sometimes float up and down amid the mists and rainbows, or that animistic demons lurked in the green shadowy depths of the chasm.

The Havasupai have long been a self-sufficient people, combining the settled life of the agrarian with the nomadic life of the hunter and gatherer. Corn was their primary crop and was usually planted in April or May. Using simple irrigation techniques they flooded one section of land after another. Two days later corn was planted after soaking the seeds over night. A digging stick was used to loosen the soil to a depth of about eight inches. A hole was left two to three inches deep. Before placing the first seed in the hole, the planter said a prayer. He then dropped six to ten kernels into the hole. Before filling in the hole with soil, an additional kernel was chewed and then blown toward the two white marks on the canyon wall representing the original ancestor ears presented to the Havasupai by their mythical heroes. The rest of the field was then planted without further ceremony.

Other plants that were grown included squash, pumpkin, sunflower, cotton, gourd, lima beans, kidney beans, and devil's claw which was used in basketry. After the harvest most food stuffs were dried to provide lightweight, storable food for the winter months of hunting and gathering on the plateau.

One observer remarked, "As jealously as the Havasupai guarded their canyon and as passionately as they loved it, the tang of autumn in the air turned their thoughts to a winter home on the mesa, and started them packing their possessions with a happy abandon. All summer they had prepared for this — harvesting, preserving their food, and setting aside a portion to take with them. . . . Nothing could be permitted to interfere with this jaunt



Travel by horseback is one of the few ways of getting to Supai.

to the outside. . . when I saw their childish delight as they made their departure, ponies loaded with cumbersome bundles, I knew that they were motivated by the very human desire for change, to get outside, where they could look about, with the full sweep of the vaulted sky above, with endless miles in which to wander. Not an Indian who was physically able to ride but longed for this trip to the mesa."

It was during this time on the mesas that the Havasupai women gathered seeds and nuts to supplement their food supply. Pinyon nuts were a favorite source of fats and protein. In September the green cones were collected and heated over a fire to open them up so the nuts could be collected. Most of the harvest came later in the season. Pinyon nuts were also a source of income and could often be sold to Anglo stores throughout the area.

Other wild seeds were collected and stored in baskets made by the women. Wild sunflower, Indian millet, peppergrass, mutton grass, Indian wheat, tansy mustards, blazing star and walnut were gathered for winter use.

When the winter snows came the men prepared to hunt. Both large and small animals were used for food. Hunting sticks or clubs were used for rabbit, porcupine or bobcat. Sometimes birds and rabbits were felled by a well-thrown stone or with the help of a sling. Dead-fall traps and snares were also used.

When hunting larger game the Havasupai used the bow with a sinew string and arrows made of hard woods such as serviceberry. Pronghorn used to be plentiful in the lightly forested plains south of the Grand Canyon. Hunters would use a disguise to attract the animals. Wearing a stuffed pronghorn head and with his body painted white, the hunter would hold two sticks as front legs. He would then prance around imitating the creature's habits by shaking the head and playing with bushes. After attracting their attention, curiosity did the rest. The pronghorn actually came to him! With quick action the hunter would take out his bow and bring down several using stone tipped arrows.

After the pronghorn population dwindled, deer became a more important source of meat. Other animals used for food included the bighorn sheep, burro, horse, elk, mountain lion, and cattle.

Because wintering in the canyon meant very little sunshine, the plateau was a warmer area to weather out the cold winter months. Still the Havasupai needed fire to keep warm and to cook their food. They used two methods for fire building. The bow-drill method which used a fire board, bow and drill to create friction, and the strike-a-light method, similar to the flint and steel methods used in colonial times.

The materials used for strike-a-light were difficult to obtain. The equipment — cotton tinder in a hollow tube, and pieces of chert and flint — was kept in a special container of deer or pronghorn skin. The cotton was raised especially for this purpose from seed acquired from the Hopi. The cotton

was twisted into loose threads with the fingers and then braided into a thick cord about a foot long. This was then threaded into the hollow tube which was usually the femur of a bobcat. To create a fire, the charred end of the cotton wick was pulled out of its protective tube and held together with the chert, in one hand, and a spark was struck with the flint held in the other hand. When a spark was caught in the cotton tinder it was blown into a flame and then used to start other tinder on fire. Afterwards the wick was pulled back into its protective tube, which extinguished the flame.

Once a fire was built it was usually kept burning. When fire wood was limited, or when it was necessary to change camp, a firebrand was made. This consisted of a spiral coil of juniper bark tied with yucca. The ends were set on fire and kept smoldering by blowing them at intervals. Fire could be kept with this method from dawn until noon. The Colorado was called "The River of Firebrands" by the early Spaniards who found the Yuma Indians using similar firebrands to keep warm.

The Havasupai had their favorite cooking techniques and when modern utensils were available, many still preferred the ancient methods. Instead of using a frying pan, a flat rock was thoroughly heated in the fire and then pulled to one side to dust off the ashes. Meat from deer or bighorn sheep could then be fried on this hot surface.

When it was necessary to boil water a big barrel cactus was often used. With the spines burnt off and the top

opened up, the pulpy interior was mashed and pounded until the water stored within was separated from the soft inner tissues. Stones, heated red hot in the fire, were dropped into the water with bent twig tongs. Foods boiled in a barrel cactus took on a special flavor. Rabbit, quail, and hen eggs were often cooked by boiling. Boiling was also used in the preparation of mescal paints, arrow poisons, and medicinal teas.

Although the Havasupai have been forced to give up their nomadic ways, they are still striving to support themselves through their pack animals and the tourist business. The trip down takes about three hours and is well worth the sore muscles and tired feet. Swimming, diving, cave exploring and hiking offer plenty of adventure in a remarkable setting. Be prepared with a well equipped pack — the closest major city is over 120 miles away. ●

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ABOVE — The campground near Havasu Falls is shaded by a grove of cottonwood trees.

LEFT — A modern home in the Supai village. Corn is still grown in garden plots.



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Staff Report

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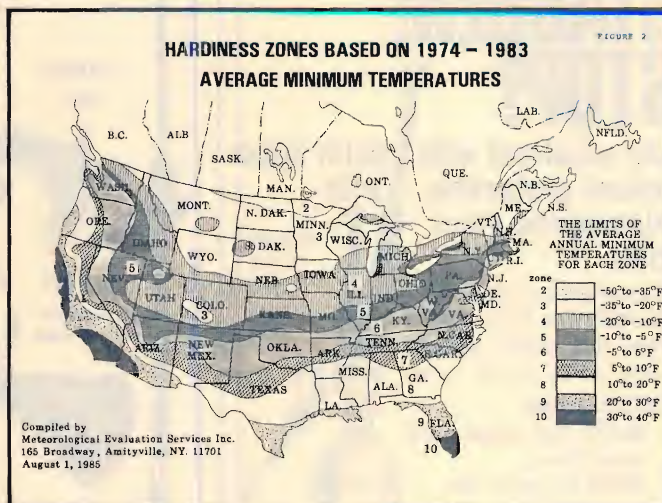
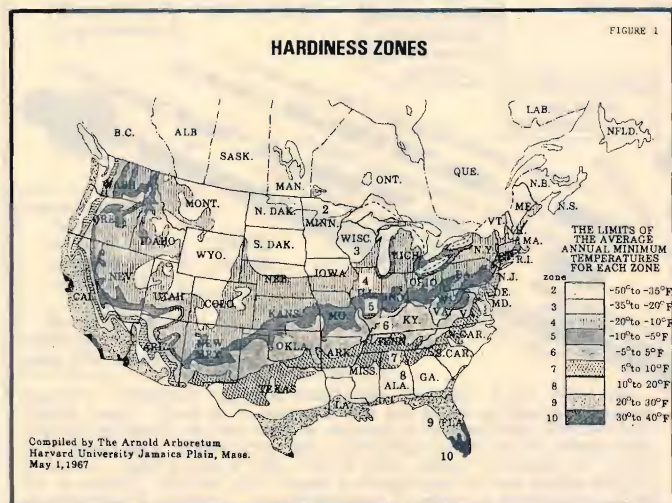
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Climate Change

(Continued from page 27)



The Arnold Arboretum Plant Hardiness Zone map was revised in 1985 to reflect a decade of colder than average minimum temperatures.

Editor Frederick I. Scott Jr., *American Laboratories*, September 1983.

These are a sampling of the flood of articles published in recent years on predictions about how man's production of greenhouse gases — chiefly carbon dioxide — will affect the climate. In fact, there has been so much publicity about the greenhouse effect that even newspaper articles (which are often based on the underlying assumption that readers are about as smart as the average fourth grader) assume that everyone knows what the greenhouse effect is.

But in case you've been hibernating somewhere for the past decade, a brief explanation of the greenhouse effect theory: greenhouse gases such as carbon dioxide caused by the burning of fossil fuels — coal, gas, wood, etc. — rise into the atmosphere where they form an invisible window (like the windows of a greenhouse) that traps heat radiated from the earth that would normally escape into space, resulting in higher average temperatures on earth.

If you've been following the climate story for long, you might have noticed one glaring contradiction. Back in the 1970s, the prevailing opinion was that the earth was cooling, headed for another ice age. The popular books on the subject such as *What's Wrong With Our Weather?*, *The Weather Machine* and *The Weather Conspiracy*, *The Coming of the New Ice Age*, predicted a major cooling threat in our time.

Now in the 1980s, all you hear about is the greenhouse effect. You read arti-

cles stating, "The gradual warming of the earth is inevitable. . . all scientists agree that a gradual warming of the earth is inevitable and that a rise in sea level will likely result." Greenhouse warming is in; ice age is definitely out.

So what happened? Was there a decade-long heat wave that changed the climate prognosis? No. Actually, recent years have seen some of the *coldest* temperatures ever recorded in the U.S., which led to a downward revision of the Arnold Arboretum Plant Hardiness Map, one of the two major maps used in the U.S. to recommend plants for different climate zones.

"The most recent decade has witnessed some of the coldest temperatures recorded in National Weather Service history, not only in extreme minimums, but also in monthly averages as well as season extremes," says Mark L. Kramer, consulting meteorologist, in a paper announcing the revised hardiness zone map. Sixty-three percent of the National Weather Service stations recorded new record low temperatures or matched record lows since 1966; 50 percent have met or tied lows from 1974 through 1983.

Some of the biggest changes were in the Southeast; the northern part of Florida was reclassified to reflect numerous hard freezes which have damaged or destroyed citrus trees.

Conversely — and here's where things get complicated — the 1980s have also seen some of the highest temperatures ever recorded. These record highs led to the oversimplified and, in my opinion, erroneous conclusion that the

greenhouse effect is perceptibly warming the earth.

The statement above, that *all* scientists believe a gradual warming is inevitable, simply isn't true. And, despite what you'll read, it has not yet been conclusively proven that the earth is warming.

Frederick I. Scott Jr., consulting editor of *American Laboratory*, has been one of the lonely voices bemoaning the attention to the greenhouse effect when we should be looking at ways to prevent — or at least mitigate the effects of — the coming ice age. Scott claims that "scientists wishing to publish on the cooling phenomenon find themselves 'sandbagged' by the review process, unable to publish their data and analyses. Nevertheless, there is compelling evidence that the world is cooling dramatically.

"When the research comes to constitute an apparently deliberate effort to conceal significant information crucial to the function and survival of the species. . . a primal scream of outrage is called for," Scott says in an editorial. "From different sources, it seems evident that a major effort is underway to direct attention away from the global climate change in process now for about the past 45 years."

Scott points out that up to the late 1970s, climatologists concluded the world was cooling, but after 1978, the greenhouse warming effect theory began to dominate. "No great breakthrough is apparent to account for the shift to emphasis on the warming theory," he says. "In 1974, the Central

Intelligence Agency issued two papers summarizing scientific literature concluding that the world was cooling quickly, expressing a potential for world chaos. In 1978, the agency's *Polar Regions Atlas* stated that the cooling trend since 1940 has had severe effects in the Arctic."

Carbon Dioxide — One fact that people on both sides of the controversy agree upon is that carbon dioxide concentrations in the atmosphere are increasing, and are likely to double sometime between 2050 and 2100. So how do Scott and other ice agers reconcile increasing carbon dioxide with the ice age theory?

John Hamaker and Don Weaver in the book *The Survival Of Civilization*, theorize that the carbon dioxide will cause a disproportionate warming in tropical areas, which will result in increased evaporation leading to more clouds covering the earth. They believe the net cooling effect caused by the cloud cover could initiate the next ice age.

Hamaker and Weaver also believe natural processes are in play here: the gradual depletion of available soil minerals by forests and other vegetation following the retreat of glacial advances triggers the cycle of events — including increasing levels of carbon dioxide — that initiate a new glacial advance.

"Evidence compiled by John D. Hamaker from his studies and experimentation provide powerful support for his conclusions that the present interglacial period is in the end of its final phase," Scott says. "If so, that end will be irreversibly and devastatingly manifest by 1990."

For the past three million years, earth has generally followed 100,000-year cycles: 90,000 years of glacial activity followed by 10,000 to 12,000 years of warmer, interglacial periods. We're currently in about year 10,800 of the interglacial period.

Some moderate climatologists — even those who believe in the warming theory — don't agree with the dramatic predictions of global disaster from greenhouse warming. Don Ahrens, author of the college textbook *Meteorology Today*, says that "gloom and doom" predictions have overshadowed more conservative views in meteorology.

"It's too early to yell wolf and start

blaming carbon dioxide for rising global temperatures and the drought," says Ahrens. "There is a vocal minority of scientists who feel that after a small increase in global temperature, the earth will begin to cool. They point to the fact that added water vapor might cause more global cloudiness, which in turn, will decrease the amount of solar radiation reaching the surface."

He says that, not surprisingly, some of the loudest predictions of greenhouse effect cataclysm have come from proponents of nuclear energy.

I wouldn't want to leave the impression that all scientists who support the greenhouse theory are dupes of the nuclear power industry. There are also other possible factors at work behind the dominance of the greenhouse theory. One is that in recent years computer modeling of climate conditions have come into vogue. Such models tend to give undue weight to the factors that can be measured, while ignoring or underestimating the environmental factors that can't easily be measured.

The computer models attempt to recreate mankind's great experiment on the planet earth. They plug increased carbon dioxide levels into a model of earth, and see what comes out. Even the modelists will tell you there are problems simulating the numerous interrelated factors that govern climate: changes in the earth's orbit, sunspot activity, the effect of clouds (this is one of the toughest, since clouds act both ways to increase and decrease temperatures on the ground), the vast ability of the ocean to store heat, the effect of dust from volcanic eruptions and man's activities, and, of course, the role of greenhouse gases to trap heat.

There's no simple recipe that adds up to climate for planet earth. In my opinion, the computer models oversimplify to the point of being worse than useless; results are grossly misleading, taking attention away from where it should be focused: on finding ways to deal with the coming ice age.

John S. Perry, reporting in the December 1985 issue of *Environment* on a major United Nations' conference on greenhouse gases, says that model experiments "continue to show a broad range of uncertainty in the impact of changes in the climate produced by greenhouse gases. The small temper-

ature fluctuations of this century suggest either a weak sensitivity of the climate system to changes in the concentration of radiatively active gases or a marked lag induced by the slowly warming ocean."

Another factor at work that could partially explain the greenhouse popularity is that it may be easier to get research funds when you predict that the greenhouse effect will cause drastic rises in the sea levels that would redraw coastlines all over the world, forcing millions from their homes. "Greenhouse effect a threat to earth life" certainly is going to get more attention — and more research money — than stating that we're in for a long chill, even though the results could be just as devastating for mankind.

One more loose end to tie up: if you take the less popular road, and stand with the ice agers, then how do you explain the high temperatures in the 1980s? Here's the answer, from an article called "Climate Change: Chilling Possibilities," published in *Science News*, March 1, 1975.

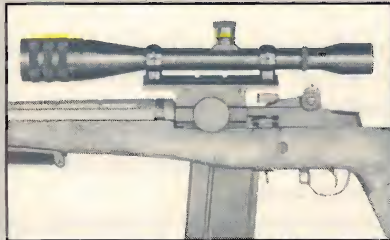
"The principal weather change likely to accompany the cooling trend is increased variability — alternating extremes of temperature and precipitation in any given area — which would almost certainly lower average crop yields," says author John H. Douglas. You could have record highs and record lows in the same year. Droughts one year; floods the next.

"Thus, while the hemisphere as a whole is cooler, individual areas may alternately break temperature and precipitation records at both extremes," Douglas says, adding that we may be approaching the end of a major interglacial cycle, with the approach of a full-blown ice age a real possibility.

He concludes that while the ice age would involve only a small change of global temperature — two or three degrees — the impact on civilization would be catastrophic.

Like Frederick Scott, I think a "primal scream of outrage" is called for. Instead of chasing the red herring greenhouse theories, we need to be studying ways to adapt to the increasingly cold temperatures and resulting disturbances such as droughts, shorter growing seasons, and increased weather variability that will accompany the return of the ice age. ●

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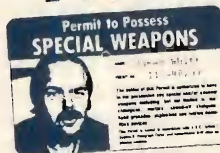


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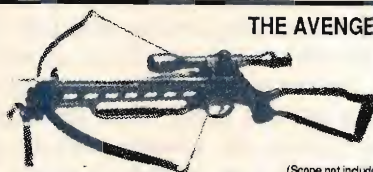
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Cold Weather Layering

(Continued on page 48)

distribute over the fabric. The coating is actually absorbed into the weave of the fabric, unlike a laminate which is glued on. Next, the coating is baked. During the baking, the bubbles harden into tiny air spaces that only permit water vapor to pass through.

Suggested Personal Layering System

Here is a clothing list for a typical winter outing — a one day ski tour when the temperature is above zero:

- thin polypropylene or polyester long underwear top
- thick polypropylene or polyester long underwear top
- fleece or pile zip-front jacket
- shell jacket
- polypropylene or polyester balaclava
- fleece balaclava
- wool knit ski hat
- sun glasses
- goggles
- Neoprene face mask
- pile bibs
- shell pants
- one pair of glove liners
- one pair of heavy wool gloves
- one pair of insulated overmitts
- one pair of liner socks
- one pair of heavy wool socks
- double ski-touring boots
- uninsulated gaiters

When buying a shell to complete your winter layering system, make sure it is big enough to cover all of your other layers. You don't want your arms to bind up as you telemark down the mountain on your cross-country skis.

And finally, don't forget to use the layering system on the most exposed parts of your body — your head, hands, and feet. Your head and neck radiate a lot of heat and it's important not to let that heat get away. The old saying, "If your feet are cold, put on a hat," is based on this fact. Worry about the head and central core first. This will prevent vasoconstriction (the closing off of blood) to the hands and feet.

Synthetics do a great job for your feet. Their wicking ability will keep your feet dry. Thick wool socks on top will help insulate and keep them warm. ●

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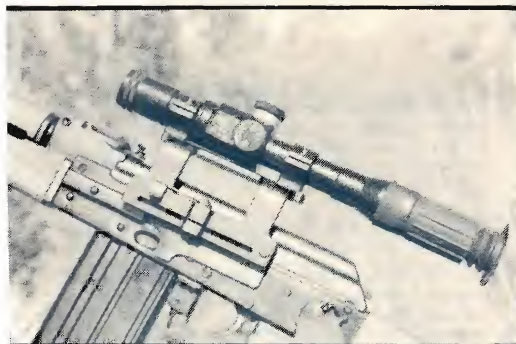
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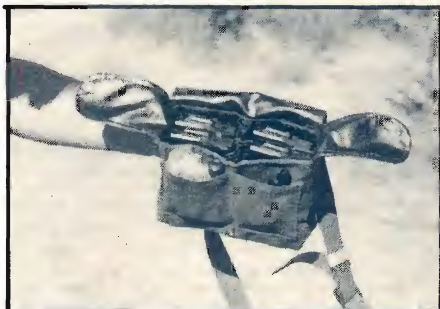
7.62 NATO AK-47 Rifle (Continued from page 24)



LEFT — The scope mount rail comes permanently attached to the M77B1. Here the Yugoslav 4 power scope and mount are attached to the rail.



RIGHT — Rear and front sights with tritium night sights flipped up.



An optional military pouch that holds four extra 20-round magazines and cleaning gear.



The AK bayonet (optional) attached to the M77B1 muzzle.

Mitchell M77B1 AK-47 Rifle: Tech Specs

Caliber	7.62 mm (.308 Win.)
Muzzle velocity	2,772 ft./sec (general)
Rate of fire	600 rds./min.
Practical rate of fire	80 rds./min.
Efficient range	660 yards
Overall length	41.28 inches
Barrel length	20 inches
Sight radius	19.4 inches
Sights	adjustable ringed post front, adjustable notch rear; flip-up illuminated night sights front, rear
Magazine capacity	20 rds.
Weight empty	8.75 pounds
With loaded magazine	10.675 pounds
Price, suggested	\$775
Distributor	Mitchell Arms Inc., Dept. ASG, 3411 Lake Center Drive, Santa Ana, CA 92704; (714) 957-5711

original factory military equipment and not available on other rifles.

Manufactured for Mitchell Arms by Zavasta-Kragujevac or Yugoslav Federal Directorate of Supply and Procurement, the gas-operated, semiautomatic, closed-bolt Model M77B1 rifle can be purchased with the Model 0N3-M75 4 power adjustable scope with illuminated reticles. This scope is made in Yugoslavia for this rifle and can be purchased separately as optional equipment. It has a suggested price with mount of \$595.

We all know the AK-47 rifle is one of the most reliable weapons ever made. The Yugoslav version — the Yugoslavs are generally credited with producing the best quality AKs available — represents the most current model in production with many refinements not found on the original Kalashnikov design.

I mentioned the thicker walled receivers (actually the receivers are the "R.P.K." or AK-47 heavy barrel receivers). You are also getting a bigger, stronger bolt and bolt assembly to handle the more powerful 7.62 NATO

cartridge.

This is necessary because of the substantially higher chamber pressure generated by the 7.62 NATO round as compared with the Russian 7.62 x 39mm cartridge made for the standard AK-47s and AKMs. The muzzle velocity of the 7.62 NATO or .308 Winchester round is about 50 percent faster than the 7.62 x 39 Russian round.

We test fired the Model M77B1 with Louis Mitchell of Mitchell Arms using Federal American Eagle 150-grain metal case boat tail ammunition firing from the shoulder and from a rest at targets from 50 to 150 yards.

Firing well over 100 rounds through the .308 AK we experienced no problems whatsoever, once we properly adjusted the gas port regulator, which should be set in the middle or center position of the three positions on it for this type of ammo. The first position allows less gas to enter the system for use with lightweight bullets and the last position allows more gas for use with heavy bullets.

Besides performing perfectly, the

M77B1 was very accurate. While we were still familiarizing ourselves with this new gun, Louis Mitchell was able to shoot tight groups at 150 yards with the Yugoslav 4 power scope as well as with his own Leupold 3 x 9 Compact scope.

Recoil is always noticeable with the .308 round and the Mitchell AK is no exception, but we had no problems managing recoil and muzzle rise and the gas operation moderates felt recoil considerably.

With its suggested retail price of \$775, its beauty, craftsmanship, outstanding design and performance, the Model M77B1 is sure to be a big hit among .308 enthusiasts. Also available in the same caliber by special order from Mitchell Arms are the paratrooper folding stock Model M77AB2 and heavy barrel Model M77B1 R.P.K. with detachable folding bipod. And don't forget that Mitchell Arms also offers these same types of the Kalashnikov rifle in standard Russian 7.62 x 39 caliber as well as the .22 caliber AK-22. ●

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MAIL CALL

Horse Packs

I am into backpacking, mostly on horseback. I would like to know if there is information on new types of saddle bags and packs. I find myself needing more space and, above all, more pockets for my equipment. I believe horses are very beneficial to our survival. They are good transportation when needed, they can serve as an alarm system and could even be used as food if necessary.

John Wooddell
Fayetteville, North Carolina

Talk to saddlery dealers and horse keepers and trainers about new saddle and pack equipment for horses and where you can find it. There are also mail order catalogs with these products in them. We agree that horses can definitely play a role in survival. See our article on survival horse breeds in the April 1988 issue.

Hazardous Materials

The first paragraph of Larry D. Weber's "Hazardous Materials" article (August 1988) brought back memories of a very similar disaster here in Mississauga, Ontario, in November 1979 causing the evacuation of the city's 250,000 residents. A freight train carrying chlorine and propane gases in tank cars derailed in the industrial section of the city. The city was virtually shut down for a week while the chemicals were cleaned up. Fortunately not one death resulted from the accident, which occurred late on a Saturday night in the industrial section of the city. Tank cars containing the deadly chlorine ruptured but the tank cars with propane exploded, thus burning off the deadly gas. This coupled with quick thinking and actions by the train's engineer reduced the extent of the disaster. The City of Mississauga was just plain lucky. It is unlikely that any amount of preparation or planning would have allowed officials to cope with a massive number of chlorine poisoning cases. Mr. Weber's suggestion for people to try to live as far away as possible from potential disasters I feel is only too well illustrated by our disaster.

Ronald Kay
Mississauga, Ontario, Canada

We agree, but in those cases where people can't or won't live far away from areas where such disasters can occur, it's best to know as much as possible about what potential hazardous materials are in or move through your area and to be prepared to deal with such situations if they occur.

Omega 10 mm Pistol

I was delighted to see the Omega 10 mm pistol on the cover of your November issue. I've been contemplating buying one for some time. In the July issue of *American Rifleman* Charles Petty made reference to the front and rear sights of the Omega which shook loose with firing. He said it was "disconcerting to fire a shot and notice the front sight depart for places still unknown." I was wondering if you encountered the same problem in testing the Omega. Also, the Pachmayr-type grips displayed on the Omega in your cover photo, I've never seen the Omega displayed without genuine Pachmayr wrap-around grips, including Springfield's own advertising brochure. Is Springfield cutting corners on the equipment they put on these guns?

Capt. David R. Root
Enid, Oklahoma

No, we did not have any problem with the rear sight in our testing of the Omega. A Springfield Armory spokesman informs us that there was a problem with the rear sight coming off on the first models of the Omega pistol produced and this problem has been corrected. Regarding the Supreme grips on the giveaway Omega pistol tested and displayed in ASG, Springfield Armory was having trouble getting genuine Pachmayr grips for the guns and needed to ship them to dealers so Supreme grips were used until delivery of Pachmayr grips made them again available. All Omega pistols at this writing are being shipped with genuine Pachmayr grips again. Incidentally, we have guns with Pachmayr grips and we found the Supreme grips just as comfortable and effective as the Pachmayrs. If you should buy a pistol with the Supreme grips and don't like them, you can always replace them with Pachmayrs. ●

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11. I certify that the statements made by me above are correct and complete.

(Signed)

Kenneth N. Yee/President

Raising and Butchering Rabbits for Organic Meat

*Start with the rabbit when learning to skin
and prepare meat for the dinner table. . .*

Regie McDaniel holds the stunning mallet in one hand, and live rabbit in the other.



After cutting around the hind legs the skin is pulled down.



Making the cut for evisceration. Note that Regie's fingers are behind the knife so that he doesn't cut into the intestines.



By Geeta Dardick

This article is adapted from Home Butcherings and Meat Preservation by Geeta Dardick, TAB Books, 1986. Illustrations by Sam Dardick. — The Editors.

IF you are interested in becoming more self-sufficient, you should consider raising rabbits. You can start with only a few animals, and within a year, you will have a fine supply of organic meat for your larder. However, you can't just stick a couple of bunnies in any old cage, throw in table scraps, and expect to end up with food for the family. Like any other farm animals, rabbits require precise care and attention.

Raising rabbits is a little different than raising meat chickens or wiener pigs. With chickens or pigs, most growers buy babies in the spring, feed

them, and then butcher them in the fall. Your venture into rabbits will be more all-encompassing because it will involve the breeding process. Another way to think about this is that the mother rabbit will be doing most of your work for you.

You will want to start your foray into rabbit production by purchasing at least two females (does) and one male (buck). These will be your breeding stock. If all goes well, each doe will give you 32 babies per year.

Since you are raising your rabbits for meat, you will want to buy one of the fast-growing, medium sized breeds — New Zealand White, Californian, or Champagne d'Argent. You might be tempted to choose one of the giant varieties like Checkered Giant or Flemish Giant. They seem appealing because of their size, but they are actually less efficient than the medium breeds in converting feed into flesh.

Much of their seemingly larger size is big bones.

If your feed store has no breeding stock available, check with your county agricultural agent for the names of reputable breeders in your area. You will want to pick out your rabbits and check that they are well-developed and healthy. Ask to see the breeder's records. You want does that have a past history of having babies easily and taking care of them adequately.

Before you bring your rabbits home, you should have their cages ready. You'll want a hutch for each rabbit. You can buy these or build your own. They should have wire bottoms (but not chickenwire) so the droppings can fall through. Most people use all-wire cages, but you can also use some wood; in fact, if you do end up buying a giant breed, you might want some of the floor space made out of wood to protect their feet which are quite ten-

der. You can put some kind of matting to cover the wood.

Cages should measure about three feet by three feet and stand one and one-half feet high. Make the doors large enough so you can take nest boxes in and out. For giant breeds make your cages a little larger. A mature giant rabbit can weigh about 14 pounds.

Breeding Rabbits — You can start breeding does at five to seven months old. You'll breed your doe by taking her to the buck's cage and leaving her there for a minute until he breeds her. Watch to be sure. Keep a record of the breeding date. Don't bring him to her cage. She may attack him and kill him.

About 25 days after breeding, put a nesting box in the cage with your doe. The box should have a bottom, top, and sides. Make its entrance several inches above the bottom of the box so that the babies couldn't possibly fall out. Fill the box with good nesting materials, about five inches in cool weather and two inches in warm weather. The doe will mix her own fur in with the nest.

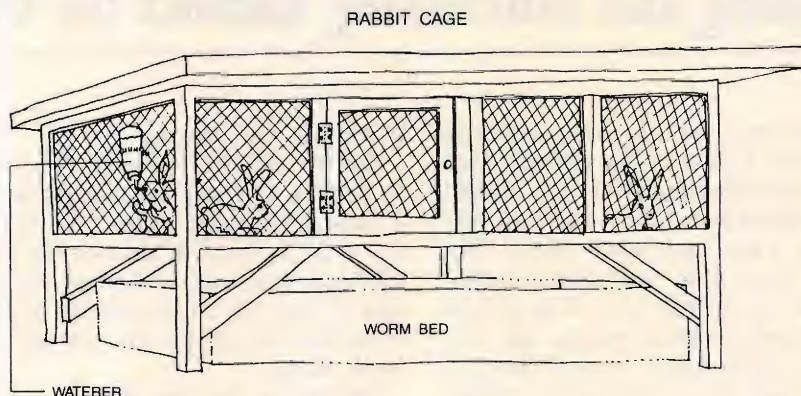
You want the doe to have her babies in the nest, so they will stay warm and not fall through the wire. Hopefully she will oblige you. She will have them somewhere between day 28 through 32. When born they are hairless, blind and deaf.

About 24 hours after birth, count her babies. Take out any deformed or dead babies, and reduce the litter to seven to nine babies. Your rabbit can feed about nine babies, but not more.

At about four weeks old, the babies will start coming out of the nest. At this point you can remove the nesting box, but still keep the babies with the doe until weaning age at eight weeks. At this age you can butcher them. They should weigh about four pounds, and dress out at two pounds.

You can keep harvesting the babies for meat up to six months old, but after ten weeks old, you'll need to house each rabbit in a separate cage. You will want to butcher all of the males, as well as any females that don't have perfect features. Save your best females to increase your breeding stock.

Feeding and Caring for Rabbits — Rabbits eat greens, grain and hay. You can use commercial feed, home-raised feed, or a combination. The feed should be about 15% protein. The simplest method is to buy a commercially pre-



pared rabbit feed, which is a pellet with a combination of grain and hay in it. Or you can feed grain to your rabbits, supplemented with roughage cuttings. Rabbits like all the green feeds from the garden, but if you feed too much of your garden products or table wastes (which actually contain a lot of water), the rabbits may not consume enough of their other feed to make adequate weight gain. Too much wet feed also can give the rabbits diarrhea.

If you use a pelleted feed, you can keep it in front of the rabbits at all times. However, you must be watchful that your breeders do no get overweight. If they get too fat and sluggish, they may not breed. Also, the doe can actually produce too much milk which can cause breast problems.

Feedstores carry a number of different rabbit feeds. Read the labels carefully. Some feeds contain chemicals that you won't want to feed your rabbits.

Don't be shocked if you see your rabbits eating some of their soft, partially digested fecal pellets. It's simply something that rabbits like to do. The word for this is coprophagy.

Keep water in each cage at all times. If you use those upside down waterers that rabbits suck, you won't have to worry about them spilling their water.

Rabbits can take a lot of cold, but not drafts. Don't place the cages where the wind can blow through them. A man I know lost all of his rabbits from locating his cages improperly, and it happened in one night.

Overheating can also be a serious problem. Too much heat will kill rabbits equally fast. If you see they are overheating, try putting ice cubes to their ears. Or better yet, locate your hutches where your rabbits can't overheat, even in super-hot weather.

Try not to excite your rabbits. Strange noises scare them. Some growers keep

a radio playing so that the rabbits become used to a noisy environment.

If by chance your rabbit gets so excited that she doesn't care for her young, give her another chance or two to breed. If she continues letting her young die, cull her.

If you have a garden, you should consider raising earthworms right under your rabbit cages on straight rabbit manure. The earthworm-rabbit connection is a real plus for the serious self-sufficient farmer.

Butchering Rabbits — Butchering a rabbit is quite easy. Nail a board to a fence or wall at your eye level. Hammer in two #16 nails (long nails) about eight inches apart from each other. . . but don't hammer them in very far. You'll be hanging the rabbit from these nails after you stun it. It works best if your nails slant upward. That way the rabbit can't fall off of them.

You can keep your butchering efficient by having four containers at your side before you begin. You will need two pans of water — one for washing your hands and knife, and another for washing and cooling your rabbit. A third little dish for the heart and liver would also come in handy. The fourth pan will hold the throwaways, such as the head, intestines and blood.

There are two ways to kill a rabbit. Take your pick. You can break its neck, or you can stun it by hitting it in the head.

To break the neck of a rabbit, hold the rabbit by its back legs with one hand and by the head with your other hand. Put your thumb on the back of the rabbit's neck, just below the ears. Put your four fingers under its chin.

Now stretch the animal out. Then press down with your thumb, and at the same time raise the rabbit's head rapidly. This motion will dislocate the neck. If you did it properly, your rabbit is now unconscious.

Raising and Butchering Rabbits for Organic Meat

Mike Getz, one of my neighbors, had difficulty breaking his rabbit's neck with this technique. "I was taught the method by a fellow who has very strong arms," explained Mike. "But when I tried it, the rabbit started screaming. I don't know if you have ever heard a rabbit scream, but it is a loud, high-pitched scream that just devastates you. Apparently, I didn't have the arm strength to break its neck fast enough, before it knew what was going on."

Mike prefers to kneel with the rabbit between his legs. The rabbit sits up in its normal position, with Mike straddling it snugly. When the rabbit feels calm (and Mike feels calm), he strikes it on top of the head with a large rubber mallet. Then he hangs it up and cuts off its head.

Another method to stun a rabbit is to hold it upside down and stike it at the base of the skull.

Regie McDaniel stuns rabbits with a hammer. He holds them by the feet with his left hand and swings the hammer with his right hand. It takes less than a second.

You aren't really killing the animals with either method. You are just knocking them out. Explains Regie, "I can hit them in the head, and have their heart out before it stops beating."

Regie can butcher a rabbit from start to finish in five minutes. Such speed comes from killing 50 or 60 rabbits at a time. Reggie says that when you do that many, you get fast so you can get finished.

Immediately after stunning the rabbit, cut off its head. You may find that it is easiest if you hang the rabbit up first, and then cut the head off. Or you can cut on a table, and then hang up the headless rabbit. In either case, cut the head off as high up as possible, right behind the ears. Regie McDaniel doesn't cut off the head until he finishes skinning, but he works very fast. If you are slow, you are better off cutting off the head and bleeding the rabbit, so that it won't have any pink taint around the joints.

Now hang up your rabbit. Make a little slit in the back legs, just above the hock. (The hock is the bend in the leg above the foot, like an ankle in reverse). Feel for the spot between the tendon and the bone, and pop your knife in there to make a convenient

little hole for hanging.

Cut the skin around each hind leg. To do this, you will run your knife in a little circle right below your nails. Cut a slit in the skin between the two hind legs. Run your knife from the inside of one leg to the inside of the other leg. Cut off the tail. Cut off the front paws.

Starting at the hind legs, carefully separate the skin from the carcass. You want to leave all fat on the carcass and not on the skin. Work your fingers between the hide and body as you pull the skin off. Basically, you can peel the skin off like a sweater.

If need be, you can run your knife between the skin and body, to help separate one from the other. In an older rabbit, this may be necessary. Remember to be careful if you plan to save the skin. You don't want to slit it.

The skin is off, and you are ready to clean your rabbit. You will be cutting the rabbit open, from a point between the two back legs, all the way down the belly.

Insert your knife between the hind legs, and cut the pelvic bone. Now slit down the belly. To make sure you don't cut up the intestines by mistake, keep your finger ahead of the knife as you slice downward. If your knife strays, it will hit your finger, and not the rabbit's bladder. Cut all the way down to the chest.

Now that the intestines are entirely exposed, pull them out by grasping the stomach with one hand. At the same time, hold the liver in place with the thumb of the other hand. You don't want to pull it out just yet. Throw the intestines and stomach away.

Now remove the liver being careful to cut off the gall bladder without breaking it. The gall bladder is the little green sack that is hooked to the liver. Throw it out.

Remove the heart, also, and save the liver and the heart in your little dish. The lungs and kidneys are still inside the carcass. Pull them out, and throw them out with the intestines and other refuse. If you can't get the kidneys out, just leave them inside.

You can now rinse off your carcass with cold water. If you want to cool it rapidly, you can leave it in cold water for 10 to 15 minutes for cooling. But don't soak it too long. Water adulterates meat. Chill in your refrigerator.

If you've butchered several rabbits, wrap each one in a heavy plastic bag, and freeze them. ●

Rabbit Recipes

BARBARA'S HASENPHEFFER

- 3/4 c. vinegar
- 3/4 c. red wine
- 3/4 c. water
- 3 medium onions, finely sliced
- 4 whole cloves
- 2 bay leaves crumbled
- 2 tsp. salt
- 1/2 tsp. tarragon
- 5 tsp. sugar
- 3/4 tsp. black pepper
- 1 rabbit, cut in pieces

Make a marinade from the vinegar, water, wine, onions, cloves, bay leaves, 2 tsp. salt, tarragon and pepper. Let rabbit sit 24 hours in the marinade at room temperature. Remove rabbit. Dry off rabbit and dredge pieces in salted flour. Brown in melted butter or bacon drippings. Pour marinade back over browned rabbit. Cover and cook over low heat, 45 to 60 minutes until tender. Remove rabbit. Combine 3 tb. flour and water to make a paste and blend it into gravy. Heat and stir until thickened. Serve over rice.

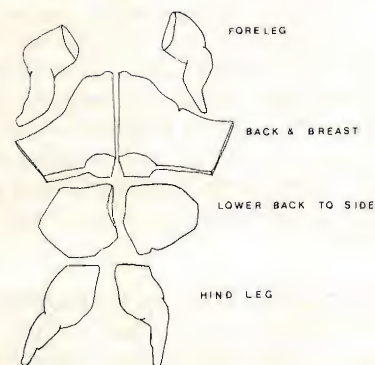
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Parbroil pieces of rabbit for ten minutes. Cool.

Dredge rabbit pieces in seasoned flour, then dip in eggs, and dredge again in flour or rolled cracker crumbs.

Fry in oil until golden brown on all sides. Reduce heat and cover and continue cooking 40 minutes, turning every 10 minutes or so.

Make a gravy from the pan drippings if you wish.



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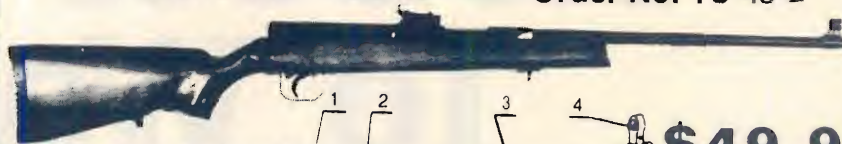
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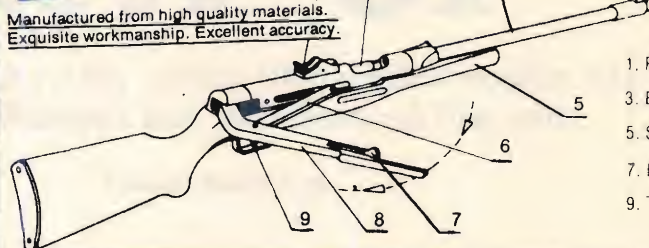
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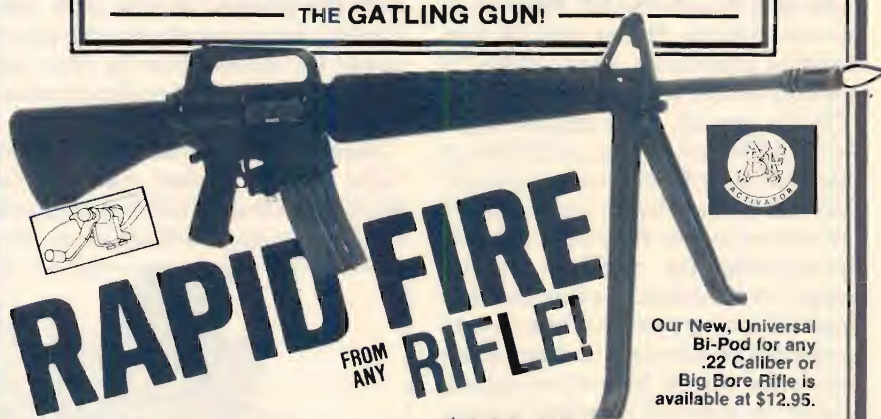
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Robots Go To War

The silicon soldier will arrive, with consequences that will be profound and unpredictable...

By Richard Bocklet

VULTURE-LIKE, surveillance drones scan the terrain, spying on military movements and communications, and feeding data back to distant command posts. Then, a fleet of decoy drones beams signals to enemy radar sites drawing anti-aircraft fire and their accompanying electronic "fingerprints" for the third echelon of robot aircraft. Small and hard to detect by enemy spotters and guided by miniature on-board computers, these kamikazi vehicles then drive onto the radar and missile sites for the kill. Meanwhile, the surveillance drones provide commanders continuous close-circuit TV coverage of the ensuing attack.

On the ground, robot minesweepers are tasked with clearing a path through enemy-armour defenses and are totally oblivious to chemically contaminated environments. For the allied advance, sense-and-destroy missiles are air-dropped or fired behind enemy lines by powerful artillery pieces. These sensor-fused missiles decouple and parachute down scanning for high-value targets. A tank, or armored personnel carrier spotted, they fire a deadly metal payload through the vehicle's lightly protected roof.

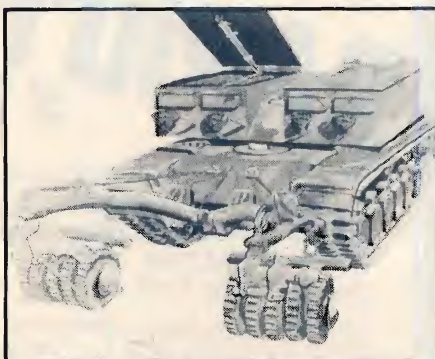
Now battalions of robotic vehicles including pilotless tanks, teleoperated mobile anti-armour platforms and other remotely controlled battlefield systems speed into action. Using powerful microprocessors for guidance, they are crammed with TV scanning sights, radars, infrared sensors and sophisticated listening devices allowing manned master tanks or off-site commanders to target enemy armor.

Multi-purpose wheeled vehicles are controlled by operators bedecked in

helmets with stereoptic video receivers and headphones located in a mock-up of the driver's cockpit 20 miles away. With a 3-D image of the battlefield scene, a twist of their joystick sends deadly missiles into enemy tanks.

Amidst all the robotic activity, the soldier still plays a direct combat role. He's dressed in a 200-lb. exoskeleton armor suit that's resistant to .50 caliber bullet hits and immune to biological weapons' toxic clouds. The infantryman maneuvers through the battlefield with the greatest of ease with small electric motors installed in the legs for power. He directs them by fiber optic sensors on the helmet reading his brain wave commands.

Meanwhile, as the land battle wages, fleets of robot surface craft and submarines use their artificial intelligence and sophisticated sensors to do sonar



The Robotic Obstacle Breaching Assault Tank (ROBAT) is designed for mine clearing operations (U.S. Army).

surveillance, lay mines, and launch torpedoes or missiles at preprogrammed targets. In one mode, computer-controlled submersibles stealthily patrol the seas for long periods using sonar and magnetic sensors to search out enemy

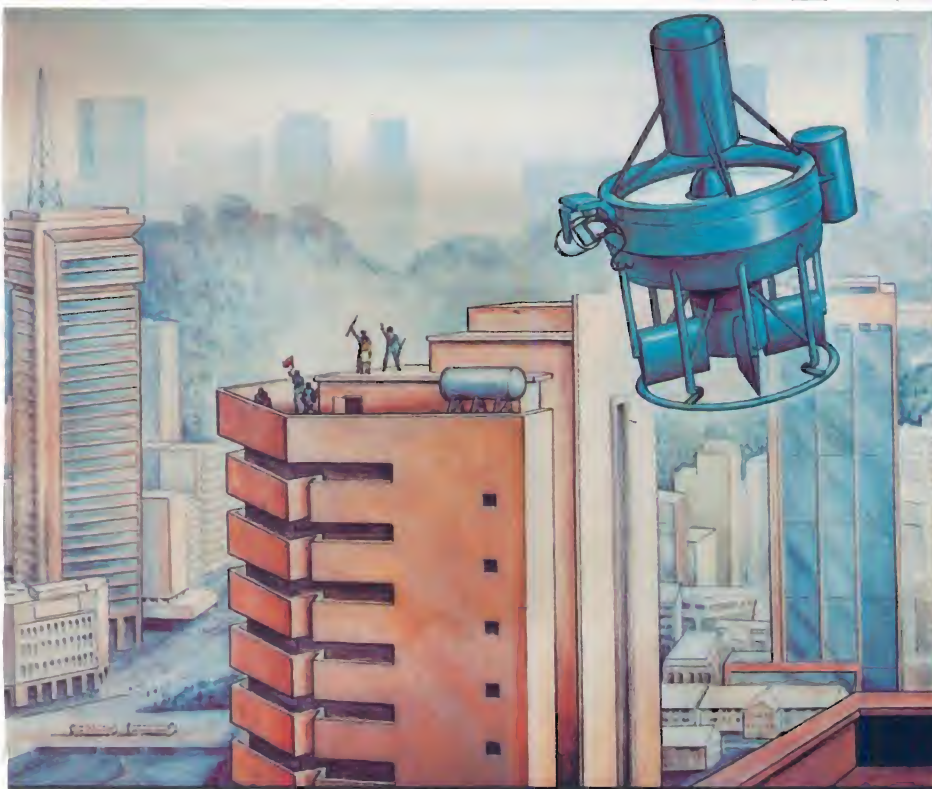
subs, battleships aircraft carriers or merchant vessels and automatically fire their lethal cargo into them.

As in all wars, there's violence and horrible destruction but this time with a difference. The fields of battle are cluttered with more robotic than human carnage, the metal carcasses of defeated machines in a highly surrogate war of technologists trying to outwit the scientific skills of worthy opponents.

Robert Finkelstein, president of Robotic Technology, Inc., Potomac, Maryland, and Board Member of the Association for Unmanned Systems, reported on the future impact of robots in the defense picture for the Armed Forces Journal. "Telerebots could ultimately alter military operations and force structures," he declared. "Operators can be placed far from the battlefield, even halfway around the world (via satellite relays), controlling their vehicles and weapons platforms. The unmanned vehicles could behave fearlessly and aggressively on the battlefield.

"Operators need not have the youth and strength of combat troops," he continued. "Telerebots can be operated by older men and women, or perhaps by civilians working in shifts. Vehicle distances are limited only by fuel and maintenance constraints. Shifts of alert, rested operators would be at the controls."

Robots are attractive to the military for many reasons. One is demographic: By 2000, the 18 to 24-year-old recruit pool will decrease by 20% while entry-level jobs will expand. This could mean too few soldiers to maintain defense readiness. Then too, with more complex weapons, the cost of trained, skilled



The Marine Corps has successfully tested the Airborne Remotely Operated Device (AROD). It can travel up to two miles away and can hover in 30 mph winds. It is shown here in an anti-terrorist role (USMC).

personnel zooms. Robots are economical and effective force multipliers. Lose a single piloted aircraft and it costs \$25 million — the loss of a 400-lb drone is about \$10,000. Meanwhile, machines are expendable — soldiers are not.

Robots can function in all kinds of climatic conditions, in high or low altitudes, on land, on sea, in the air, or in outer space. In nuclear, biological, chemical (NBC) contaminated or explosive environments or missions bordering on the suicidal, robots stand ready, willing and able to serve. Their endurance and strength is superb and some can lift weights five times their own weight. Hazardous work aside, robots free essential manpower to perform higher priority rather than byrote tasks.

Robotic missions abound, including surveillance and reconnaissance, defensive and offensive operations, NBC detection and monitoring, explosive ordnance disposal, repairing and maintaining equipment, fighting fires and tedious sentry duty. Forward observer for precision guided missiles, smoke laying and electronic jamming, and decoy are additional uses.

Israeli Success — Some of the most sophisticated military robots are RPVs, used by the Israelis with outstanding success in battle with their Arab adver-

saries. For example, in June 1982, the Israeli armed forces launched their long-expected attack on Palestinian strongholds in southern Lebanon, then moved northward to the Syrian-controlled Bekaa Valley. There, they faced a formidable armada of 600 Syrian tanks protected by Russian SAM-2, SAM-3 and SAM-6 surface-to-air missile batteries.

The Israelis used Scout and Mastiff RPVs (only 3.5m long, 0.94m high and a wingspan of 3.60 meters and made of fiberglass which is transparent to radar). Some electronically jammed Syrian communication systems while others decoyed their radar into identifying themselves and their anti-

aircraft batteries. Other drones alerted Israeli Air Force pilots as Mig fighters took off. Before they were barely airborne, the Israelis shot down 79 enemy planes, while losing only one, as Air Force bombers quickly destroyed the 20 SAM sites. As the scenario unfolded, RPVs relayed live-action pictures back to Israeli generals who called for additional maneuvers as required.

Impressed by the Israeli lesson, the U.S. Army pumped \$900 million so far into development of its own small, propeller drone, called Aquila. Mounted on a truck, the Aquila is rail launched and recaptured by an accompanying net. It carries a TV relay camera as well as a laser target designator. Its missions include target acquisition and designation, surveillance, reconnaissance and damage assessment. It successfully completed developmental testing in mid-1987 and awaits future funding.

The Marine Corps successfully tested its electrically powered, 80-lb., 3 ft-in-diameter Airborne Remotely Operated Device (AROD), resembling a small flying saucer. It can travel two miles away and hover in stable condition amidst 30 mph winds. A later model will progress to a 25 hp gasoline or diesel-engined system and be used at the company or battalion level in direct support of the troops.

AROD allows the commander to see around obstacles or what's happening over the next hill for maneuver planning or target location. It can monitor for chemical or biological agents or, in an anti-armor mode, kill tanks by fir-



The U.S. Navy Control System Test Vehicle (CSTV) is a 1/12 scale autonomous submarine for hydrodynamics and controls research (U.S. Navy).

Robots Go To War



The Army Robotic Combat Vehicle is designed for intelligence gathering, NBC monitoring and mine emplacement.

ing hypervelocity rockets into their most vulnerable upper areas.

As AROD bobs up and down terrain for concealment, it's guided by a thin fiber optic cable link that transmits live images from its on-board camera to a heads up display on the controller's face plate. Like a video arcade game, the craft's movement is directed by the operator's joystick.

Currently, the Army Robotic Combat Vehicle Program at Ft. Knox, Kentucky, is developing a generic chassis to accommodate a variety of modules depending on mission, like direct fire, intelligence-gathering, NBC monitoring, obstacle breaching or mine emplacement. One such vehicle for fielding in

the 1990s, the Teleoperated Vehicle (TOV), was tested both on the Army's Fast Attack Vehicle — a militarized dune-buggy — and the larger High Mobility Multi-Purpose Wheeled Vehicle the successor to the jeep. Linked by 18 miles of fiber optic cable, the TOV uses its cameras, electronic sensors, laser designator and rangefinder to supply on-the-spot intelligence; its MK-19 grenade launcher or M-60 machinegun for area suppression; or heavy TOW I missile launcher as a tank killer.

Robotic underwater vehicles currently perform such jobs as repair, salvage, material-handling and exploration on the ocean floor for both mili-

tary and commercial purposes. Most are teleoperated vehicles tethered to a surface command vessel by a wire or fiber optic control link, some are radio-controlled, with a few autonomous ones now in research and development.

In 1975, the Navy developed the Cable Controlled Underwater Recovery Vehicle (CURV) which recovered hundreds of unexploded torpedoes, bombs and other objects and surveyed radioactive dump sites. The Deep Drone helped pull out a downed Coast Guard cutter and a Navy A-7 aircraft. The small, light Submersible, Activated, Teleoperator (SCAT) replaced divers in observation and surveillance missions. Over the past decade, such tethered robots also performed mine-destruction tasks.

The Navy is conducting research on a robot sub for 21st-century warfare, called Long Range Autonomous Submersible (LRAS), to deliver payloads of 50 tons as far as 10,000 miles away. It could be tasked to monitor traffic at strategic check points, intercept radar communications, and reconnoiter mined areas inaccessible to standard subs. LRAS could lay mines, launch missiles at pre-programmed targets, or be set into attack mode by enemy vessels' acoustic signatures. Ultimately, coordination between such vessels could produce fleets of submersible robots posing highly lethal oceanic threats.

Finally, robotics is needed for the battle for space. At least three-quarters of all hardware circling earth has a military function — the vast majority unmanned. Space-based robots provide much valued military intelligence. A 1984 NASA study proposed extensive use of advanced automation and robotics for space station and manned program support.

In sum, technology is upon us and the battlefield will be revolutionized by it. In one sense, decreasing human risk and casualties, robots make war more feasible. In another, they insure combatants aren't denied the battlefield by an enemy using biological, chemical or precision "brilliant" munitions which are clearly possible in upcoming conflicts. Truly, unmanned systems may be the only answer to survivability on future fields of engagement. A major power oblivious to this proceeds at its own peril. The robots are coming. ●



The Pioneer RPV system, deployed on the USS IOWA is a drone that is ship launched and net retrieved. With onboard computer and day and night TV camera for area reconnaissance, it has a range of 110 miles (U.S. Navy).



The U.S. Army is developing the Aquila, a drone that is rail launched from a truck. It carries a TV camera and a laser designator (U.S. Army).

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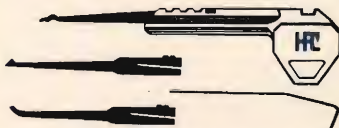
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